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EDITORIAL

More On REA Telephone Rates

IN AN editorial in our Feb. 24 issue entitled "Rural Service Under REA Not Cheap," we quoted rate schedules of one telephone cooperative and three commercial companies, either granted or applied for, after the companies received loan allocations from REA. We pointed out in the editorial that the rural rates in these schedules are higher than those charged generally by non-REA financed private companies.

As we understand it, any rates charged by REA-financed companies or cooperatives must have the sanction of REA so it can be reasonably certain that the borrowers will have enough revenue to operate their business and pay back the loans, plus interest, to that agency.

The purpose of our editorial was to refute the alleged promises being made to farmers by organizers of telephone cooperatives (who in most cases are representatives of REA electric co-ops) that modern rural telephone service can be rendered for $1.50 to $1.75.

We also point out that, based on statements of REA spokesmen and in view of the rates that agency had sanctioned for its borrowers, it is clear that REA realizes that up-to-date rural service cannot be rendered at "cheap rates" —even at the level of rates now charged by most private companies. We also said we did not think REA condones or advocates the promising of low rural rates to prospective members of newly-formed co-ops.

Recently we had the occasion to go through some issues of one state and two county REA periodicals and we were interested in their statements indicating that rural rates of REA-financed co-ops will be lower than those charged by private companies. Judging by the rates of REA-financed companies and co-ops, already approved or applied for in various parts of the country, the promise of low rates by local REA co-op organizers cannot be kept and it is a vicious form of subtle propaganda to encourage the cooperative movement and to hurt tax-paying private enterprise in the telephone business.

Examples of such propaganda are the following quotations from the *Wisconsin REA News:*

"The opportunity for low-cost service through non-profit cooperatives provides remarkable contrast to the price the AT&T combine says it must have to stay in business." (Made in connection with the Wisconsin Telephone Co. rate case.)

* * * *

"Co-ops operate strictly on a non-profit basis. Patrons will be served at cost without profit to anyone."

* * * *

"Formation of cooperatives that are well operated will provide a yardstick to prevent private telephone companies from charging rates that are too high."

* * * *

"Rural telephone system costs will be brought down . . . this will put a completely new standard into force as far as determining rates for good telephone service."

The *Agra-Lite News*, a county-wide REA periodical published in Benson, Minn., recently said:

"The farmers have learned in the electric business that they can have service *for a fraction of the costs private utility companies said it would be.* Isn't it just possible that the same will hold true for telephone service?" (Italics supplied.)

The telephone cooperative whose rates we quoted in the editorial of Feb. 24 is the Gardonville Cooperative Telephone Association, Brandon, Minn., which recently received a $321,000 REA loan allocation and increased rates from the Minnesota Railroad & Warehouse Commission.

We think the letter sent to all of its subscribers by the Gardonville association, prior to its rate hearing before the Minnesota commission, is a pretty good answer to co-op organizers who promise ridiculously low rural rates. This letter, signed by the officers and directors of the association (all farmers), contained the rates which were sanctioned by the REA and the company, and later approved by the Minnesota commission. The text of the letter follows:

"This is to advise that our company has been allotted a government loan of $321,000 by the REA administrator. The purpose of this loan is to finance a program of major improvements, such as metallizing all lines in order to overcome inductive disturbance caused by paralleling power lines; reduce the number of telephones per circuit to eight, or not in excess of 10; provide each subscriber with a modern dial type telephone, equipped with the most modern lightning and power arrestors, properly grounded to protect the instrument and premises against damage by lightning or power conflict.

"Dial switchboards will be installed at Brandon and Evansville, similar to the one now in operation at Garfield. This will afford subscribers in these communities 24-hour service, including Sundays and holidays with exchange of service between all exchanges at the monthly rates hereinafter mentioned.

"Upon completion of the above installations we propose to install dial units at Erdahl, Melby and Millerville, so as to shorten the rural circuits and allow local communities inter-communication service with their respective trading centers. Erdahl, Melby and Millerville will also have direct trunk lines to Brandon, Evansville and Garfield for the exchange of service between these communities.

"The proposed improvements, when completed, will provide residents of our villages as well as our rural communities the most modern telephone service known to the art. It must be clearly understood, however, that in order to secure this needed financial assistance your company, through its board of directors and officers, is obliged to commit itself to stipulate conditions of operation and maintenance, as well as the prompt payment of principal and interest on an annual basis.

"After consultations with competent auditors, telephone engineers and other individuals of long experience, your board of directors and officers is convinced that in order to amortize this loan, pay the interest annually, properly compensate our employes for their service, pay all operating and maintenance costs, and provide for depreciation, the following schedule of rates for the various classifications of services will be necessary:

One-party business	$ 5.25	(a)
Two-party business	4.75	(a)
Rural multi-party	4.25	(a)
Extension station	1.25	net
One-party residence	3.75	(a)
Two-party residence	3.25	(a)
Four-party residence	3.00	(a)

Rural multi-party	3.75 (a)
Extension station	1.00 net
Rural schools	21.00 (b)
Charitable and eleemosynary organizations	3.00 (a)

"(a) A 25-cent discount on the above gross rates will be allowed if paid within the discount period.

(b) Annual net.

"Your board of directors proposes to file an application with the Minnesota Railroad & Warehouse Commission for the authority to adopt the above rates upon conversion to dial operation, and also request an increase in present magneto rates until such time as the conversion to dial operation is completed.

"In order that you may realize the necessity for such increases in rates we call your attention to the following comparison between 1940 and 1950 prices on just a few of the items, and this is typical of the advances that have occurred in the costs of all materials, supplies and equipment used in the maintenance and construction of telephone facilities:

	1940	1950
Magneto telephones	$20.15 each	$33.00 each
Iron wire	4.83 per Cwt.	11.85 per Cwt.
Oak brackets	42.50 per 1,000	72.00 per 1,000
Cross arms	1.0921 each	2.94 each
Dry batteries	25.00 per 100	47.00 per 100

"The price of poles has increased over 400 per cent during the past decade.

"You are all aware of the increased costs of labor and transportation, all of which affect the construction, maintenance and operation of your telephone company.

"In connection with the increased costs of rendering telephone service we desire to call your attention to the following news items:

" 'The philosophy of the Rural Electrification Administration on its telephone program, regarding modernization of plant and need for adequate rates to support it, was outlined by REA Administrator Claude R. Wickard in an address before the Indiana Farm Bureau Convention Thursday, Nov. 16:

" 'One of the things you must realize before you start is that a modern telephone service is going to cost more than $1.50 a month,' Mr. Wickard commented. 'Especially is this true if you are going to maintain good service, and I want to say on behalf of REA, which is charged by the Congress with the responsibility of getting these rural telephone loans repaid to the government, that we are not interested in the installation of any facilities which will not give good service throughout the loan period.

" 'I consider uncertain or poor service as constituting a poor risk, because when people are not satisfied with the service they are going to discontinue it. Unsatisfactory service results in reduced revenues and thereby jeopardizes a borrower's ability to repay the government loan.'

" 'We reiterate that the obligations of the indenture and our contract with the government for advancement of the financial requirements necessitate the rates above. We sincerely trust we shall have your cooperation towards accomplishing the proposed improvements for the benefit of the communities we serve. With such cooperation we assure you we will be able to provide our subscribers a telephone service that is second to none, with a completely reconstructed outside plant, modern apparatus, and facilities manned by a happy force of contented employes.' "

• • •

"If a politician tries to buy people's votes with private money, he's a dirty crook. But if he tries to buy them with the people's own money, he's a great liberal. . . .

"This strange contradiction never has been more apparent than in recent years. Yet it isn't new. It's one of the oldest laws of politics. It is the greatest problem and weakness of self-government. . . .

"This always happens in exactly the same way — by squandering money for the supposed benefit of the people. The politicians don't spend their own money, but the money of the people—yet the politicians take credit for making gifts. And always they have been able to win votes from people who thought the politicians were giving them something free. . . .

"That's what is taking place in Great Britain today. It is what surely will happen in the United States unless enough voters quickly awaken to the danger.

"Athens did it—and ceased to be a democracy, and also soon ceased to be a free state. Rome did it—and first ceased to be a republic and then just ceased to be—period. . . .

"These things happen over and over because people whose votes can be bought by political promises don't realize that the schemes aren't new—that they all have been tried and all have failed time after time. And those who do know better are not alert, or are too lazy to get out and combat the politicians, or don't take the trouble to vote. . . .

". . . The old passion for public benefits again has been fanned into a roaring flame. We are using up our savings and getting deeper and deeper into national debt.

"It is the old, old slide into financial disaster which always has ended in loss of liberty and eventual destruction."—E. T. Leech, Editor, The Pittsburgh Press.

• • •

"A personal visit to England by a competent correspondent gives a rather grim picture of life over there under socialism. The state now runs banks, utilities, the railroads, the coal mines, iron and steel industries, controls land sales, medicine and generally runs the country. Nobody can get a job except working for the government. . . . Living is costly."—Abilene (Kan.) Daily Reflector-Chronicle.

• • •

"Back in the olden days it was said that the great corporations adopted the attitude of 'the public be damned,' but now it seems that the entrenched bureaucrats in Washington have adopted a similar attitude."—Scotland Neck (N. C.) Commonwealth.

Rural Line Construction Methods

By DANIEL SEITZ
Plant Superintendent
York (Pa.) Telephone & Telegraph Co.

CAREFULLY planned details of rural plant construction will tend to prevent service interruptions and expensive maintenance. It is hoped that some of the suggestions offered in this article may prove useful in the planning of your rural plant construction. While the suggestions offered are intended to apply primarily to the one-circuit line, they may, however, be utilized to advantage on almost any type of line.

The first consideration in the construction of any line should be to select a route as straight as possible. It should also be free of trees and other obstructions, where the terrain is such that any or all of these conditions are encountered. Every effort should be made to build a line that will furnish satisfactory, continuous and economical service with a minimum of maintenance.

The selection of pole locations is most important when planning a new line. This is most important at angles in the line and where power lines are involved. Certain precautions must be observed even though the power line happens to be on the opposite side of the highway.

The line should be engineered so as to reduce corners to a minimum. In other words, keep as many poles in a straight line as possible. A definite rule should be observed in the construction of every angle in the line, i.e., the degree of angle together with the number of line wires should dictate the method of support at those points. On a two-wire line, a 30-degree angle or less may be held as illustrated by *Fig. 1*, eliminating the need for guy wires and anchor rods. Where the necessary rocks of adequate size are available, a good substantial job may be accomplished in this manner.

As a substitute for the rocks, concrete building blocks or concrete slabs formed especially for the job may be used. Short lengths of treated wood poles may be used in lieu of stone or concrete by placing them crosswise to the pole at the top and bottom of the hole for this type of anchoring.

This method of holding corner poles where several open wire lines are involved is recommended for use only on slight angles in the line. As the load and degree of angle is increased so also should the guying be designed to prevent any side movement of the poles that would cause sag in the line wires.

Fig. 2 shows the guying at a right angle turn in the line. Both anchor rods are located five feet from the base of the pole which should be the minimum distance. A lead of 10 ft. would be better, but because of local conditions this was impossible. Where space will not permit the use of a side guy, or a guy stub cannot be placed across the highway, it is sometimes necessary to use a push brace as illustrated by *Fig. 3*. This picture also indicates the right and wrong ways to do this job.

The push brace should be long enough to extend to a point near the top of the main pole and above the load if possible. The use of a short push brace, shown as the wrong method in *Fig. 3*, will act as a jack and may lift the pole under certain conditions.

Neglect in properly supporting and guying poles may not be immediately realized on a new line, but it will surely be reflected in greater subsequent maintenance expense and service interruptions.

The foregoing is applicable both to long-span and short-span construction for controlling the original line wire sag and maintaining the proper sag in the line over an extended period.

The proper stringing tension of line wire is extremely important. Exces-

Fig. 1. Holding corner pole without guy wires.

Fig. 2. Guying right angle turn in line.

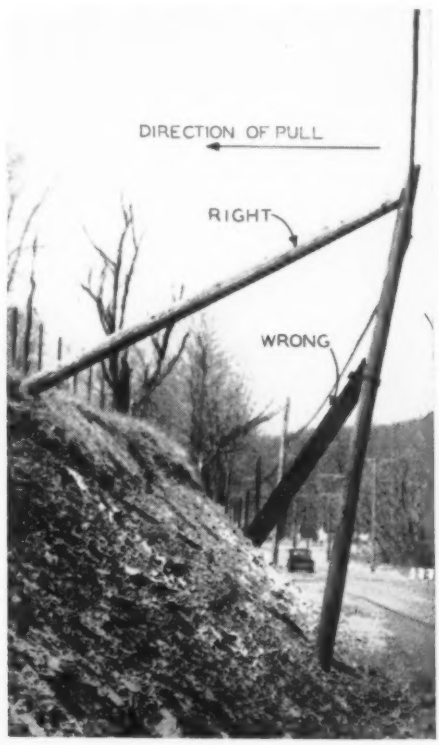

Fig. 3. Right and wrong way to use push brace.

sive tension places unnecessary strain on the wire itself as well as having a tendency to pull any slight angle pole out of line. On the other hand, excessive sag will cause the wires to swing together during wind storms.

Because of greater movement of the wires during a storm, adequate clearance between long span telephone and power wires should be provided. The following table gives the most commonly used span lengths, type of wire, and sag for heavy, medium and light ice loading areas:

Span	Kind of Wire	Sag Heavy Loading at 60° F.	Sag Medium Loading at 60° F.	Sag Light Loading at 60° F.
130 ft.	No. 85	10 ins.		
150 ft.	12 BWG	13 ins.		
175 ft.	12 BWG	18 ins.		
200 ft.	12 BWG	24 ins.		
225 ft.	12 BWG	30 ins.		
200 ft.	12 BWG		19 ins.	
250 ft.	12 BWG		30 ins.	
300 ft.	12 BWG		43 ins.	
325 ft.	12 BWG		52 ins.	
275 ft.	12 BWG			31 ins.
300 ft.	12 BWG			36 ins.
350 ft.	12 BWG			49 ins.
375 ft.	12 BWG			57 ins.
200 ft.	No. 135	12 ins.		
250 ft.	12 BWG	18 ins.		
300 ft.	12 BWG	26 ins.	22 ins.	
350 ft.	12 BWG	35 ins.	29 ins.	27 ins.
400 ft.			38 ins.	35 ins.
450 ft.			480 ins.	44 ins.
500 ft.				55 ins.

Serious consideration should always be given to the proper transposition of the line. This is true whether or not power or other wires are in close proximity to the proposed line.

Fig. 4. Tools for clearing right of way.

Space does not permit detailed information regarding the type and spacing of transpositions to be employed to meet the requirements of any particular job. This information is available, however, through publications and data prepared by the United States Independent Telephone Association Plant Committee.

It is far more economical to place the transpositions during the original stringing operation than to be forced to cut them in later to eliminate inductive noise, cross-talk, etc. Numerous types of tie wires have been developed for use in tying long spans, high strength steel line wire on the insulators.

One large telephone company, after years of experimentation with long-span construction, has adopted the conventional horseshoe iron wire tie as best suited to its needs. This particular tie is made with two wraps around the line wire on each side of the insulator. The use of pliers is not recommended to draw these ties tight around the line wire.

One objection to this method is that a broken line wire will run back a long distance through the ties. When a tree falls across a long-span high strength wire line tied in this manner, the line wire may be pressed to the ground after the tree is removed. The sag may readily be equalized again in the ad-

Fig. 5. Boring hole with construction truck power take-off unit.

Fig. 6. Digging hole with combination machine.

Fig. 7. Setting pole with combination digging and setting machine.

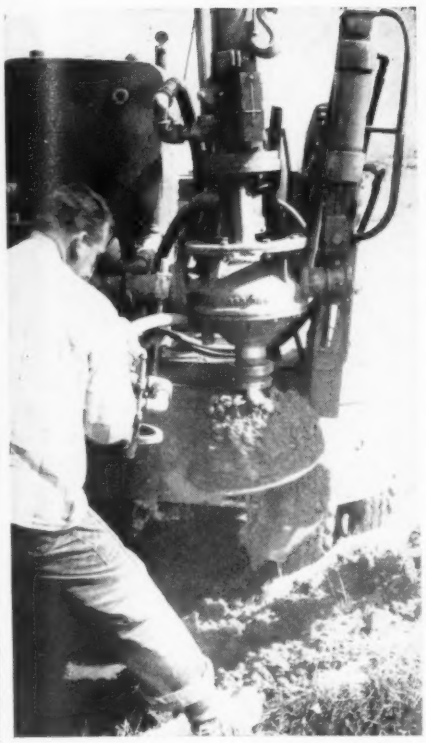

Fig. 8. Close up view of digging machine controls.

jacent spans or by adjusting the sag, using a tree trimmer or jointed rod.

Dead-ending, or in some cases, making a right angle turn on brackets will require two brackets for each wire to provide sufficient strength. The insert in Fig. 2 shows such an arrangement. Special dead-ending hardware and insulators are available for this type of job.

Always use approved insulators to provide proper insulation, especially if the line is now, or may be, used for dial service in the future.

Modern mechanized line building equipment is just as essential to the construction of the rural line as the highly mechanized farm machinery is to the farmer whose home is being connected by telephone. In addition, the conservation of labor and material is equally important.

The power chain saw *(Fig. 4)* is a most useful tool for removing trees along the right-of-way. This was accomplished on the job illustrated by an agreement with the owner which included the sawing to specified length of the felled trees. When the amount of work to be done does not justify the purchase of this equipment it often can be economically obtained on a rental basis. The hand saw attached to a long handle is very useful for regular tree trimming when certain limbs are to be removed.

Because of present high labor costs, it has become increasingly profitable to use some type of hole-digging equipment where the amount of work to be done justifies the purchase or rental of such equipment. The successful use of any hole-digging equipment depends upon the terrain in the area where it is to be used. Most of this equipment will remove reasonably sized rocks with the earth it lifts, however, there are definite limitations.

The earth boring equipment illustrated in *Fig. 5* is driven from a power take-off on the construction truck. The power is delivered to the auger through a telescoping shaft which allows the actual digging equipment to be operated on the side of a bank at a considerable distance from the truck. A shear pin adjacent to the universal joint at the truck prevents damage to the digging machine if and when obstructions too large for the machine to handle are encountered. The boring

Fig. 9. Light-weight combination truck with derrick.

head is raised or lowered with the winch line operated by the truck driver. There are definite advantages in this type of equipment because it can be maneuvered into many out-of-the-way hole locations.

The earth boring machine shown digging a hole in *Fig. 6* is operated by hydraulic controls which speed up the operation. The controls are so located that the operator is able to watch the boring tool for any irregular operation which might be due to striking rocks or other obstructions. Regardless of the uneven grade of the truck, the boring head can be held in a plumb position or at an angle as desired. The power for the boring operation is contained in the unit mounted on the truck which makes it independent of the truck motor.

The same equipment is used for lifting the pole and placing it in the hole as illustrated in *Fig. 7*. The job was completed without moving the truck from the original position required for digging the hole. Two men, a truck driver and boring machine operator can operate the machine, digging the hole and setting the pole. A third man, however, can be used to good advantage to tamp the earth around the pole in order to speed up the work.

The close-up *(Fig. 8)* shows the boring head which is shorter than some other types, but because of the speed of operation of this machine a long boring head is not required.

As an all-around piece of equipment, especially useful for the small company, the unit illustrated in *Fig. 9* serves many needs. It can be used in connection with many plant operations such as station installations, setting poles, cable work, etc. The derrick is permanently mounted on the truck and when not in use it folds forward over the truck cab. It is supported by chains in each direction when in the upright position. The capacity of the winch is sufficient to handle the average rural line pole easily.

The ladder as used in cable work is shown in *Fig. 10*. It may also be used

(Please turn to page 58)

Fig. 10. Light combination truck with ladder in position for cable inspection work.

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH
WASHINGTON EDITOR

MacArthur affair ties up normal functioning of government on domestic front. MRO order revised by NPA. Truman sets up new Wage Stabilization Board. FPC original cost theory upheld by U.S. Court.

MacArthur Ties Up the Works

IT WAS pretty hard for a business paper editor to find out anything in his own field, or get any work done, in Washington, last week. All that the congressmen and other government officials wanted to talk about was *l'affaire* MacArthur. On Capitol Hill, Congress was just about paralyzed on domestic issues. Committee hearings on routine bills were poorly attended. When a chairman finally did get a quorum, the members would talk about General Doug instead of the business at hand.

One thing, puzzling Washington observers about this sudden explosion of public reaction is whether it will have any lasting effect on the Washington picture as a whole. Generally, such passing storms of indignation blow themselves out in a short while; after which the machinery of government goes on pretty much as usual. But the cleavage of public opinion has been so sharp, in the wake of the general's dramatic speech on Apr. 19, that it could presage a basic realignment of congressional ranks. This, in turn, could affect the prospects of bills in Congress and governmental policies even on the home front.

There are some pending appropriations bills and tax bills, which are getting secondary study. They may even be changed, because some members of Congress have gotten so mad with some other members over entirely unrelated reasons of foreign policy. Thus far, the general direction of this trend seems to be against administration policies. But inasmuch as this writer has never seen anything quite like this hit the Capital since the days of the Teapot Dome or the bank holiday of 1933, he is making no forecast as to which way the trend will turn in the weeks ahead.

Defense Controls Still Grinding

But there is one branch of the federal government which keeps grinding out its daily grist of orders and releases despite the "great debate" on foreign policy. That is the National Production Authority (NPA) and related defense control agencies. Neither rain nor snow nor the darkness of the night seem to have much effect upon the blizzard of forms and paper work which has been showering down on business in general since the first of the year.

One of the recent rulings of interest to telephone companies will be the revision of NPA's general Regulation No. 4 (MRO). This is the regulation which gives business in general, including the utilities, a right to certificate their own "DO-97" orders to obtain maintenance, repairs, and operating supplies.

The latest amendment cut off a number of items on the list which could be obtained with these ratings. Rubber products had already been stricken from the list. Now come paper and packaging products, paints and varnishes, rail track, office furniture, and electric appliances. This means from now on, until special provisions are worked out for them, utilities are going to have to find such scarce items in the open market in competition with other business. Electric utilities, however, have already obtained special provision for writing their MRO orders with respect to copper products (including brass mill and foundry) and aluminum conduit. Both gas and electric utilities have been given special MRO quota provisions.

Special MRO for Telephone Companies?

The NPA Communications Equipment Division has been working frantically to clear, for final approval, a special MRO order for telephone companies. It will probably follow the general MRO pattern of the special NPA Order M-46 for the gas utilities and the NPA Order M-50 for the electric utilities. But the main concern of the Communications Division, in working up this order, is the small telephone companies.

The idea would be to take care of these companies' needs, between now and July 1—not only for maintenance, repairs, and operating supplies, but also small capital plant additions. On July 1 the Controlled Materials Plan (CMP) will go into effect. A number of the little companies are having trouble getting wire and other equipment. Their main trouble, in using the general MRO Regulation No. 4, seems to be that they have difficulty establishing base quotas that would yield them sufficient materials to carry on their service commitments. Some of these companies have been caught in the middle of necessary minor plant expansion projects—only to find that their base quotas, under the general MRO order, will not cover their needs for new supplies.

The NPA Communications Equipment Division will probably come up with a "DO" rating to give priority assistance to such companies. It is expected to be released in a matter of days. It is being drafted on the theory that these small utilities, laboring under the burden of well-known service obligations and strict regulatory supervision of many years standing, are not likely to abuse a more liberal priority allowance.

General Regulation No. 4 was designed to cover the whole national business economy, most of which is not regulated. Certain strings or conditions had to be attached (in the form of base quotas) to prevent some of these unregulated firms from writing themselves priorities for more than they might be entitled to use. But certainly no small telephone company is going to ask for a dollar's worth more of materials than is actually needed, in the light of present-day high prices and strictly regulated returns on the company's revenues. So, the NPA is going

to open the door a little, and it ought to be welcome news to the Independent industry.

One other item of passing interest at the NPA Communications Equipment Division concerns the forthcoming formation of a special advisory committee for the telegraph industry—as distinguished from the telephone industry. It will be composed of eight members representing not only Western Union but some of the international land, sea, and air telegraph communications services.

A Brand New WSB

On the labor control front, President Truman has created a new Wage Stabilization Board and the business community is not too happy about it. The President did not call any over-all labor-management conference before going ahead with this new board to take over the work of the old board which organized labor deserted.

It could be, of course, that such a conference would be futile, on the basis of past experience. At any rate, Mr. Truman set up a 16-man *advisory* committee with four labor members, four management members, four farm members, and four "public" members. This board, in turn, has recommended the establishment of a three-part dispute board (to be composed of business, labor and public members) which will handle not merely wage controversies but also controversies over union security and other issues—some of which would normally be expected to be covered by the Taft-Hartley Act.

The four advisory members representing management dissented from this recommendation. But the President decided to carry it out anyhow. The new wage stabilization board will be headed by Dr. George W. Taylor, World War II chairman of the War Labor Board and a University of Pennsylvania professor. Cyrus W. Ching, who headed the old WSB, will go back to his job in the Labor Department, as head of the Federal Mediation and Conciliation Service. The President planned to appoint the other members of the new board as quickly as possible—six from labor, six from industry, and six from the public—doubling the total membership of the old board.

The four management advisers to the President were willing to have the proposed dispute board handle wage issues, but they did not want it to handle controversies about union security, etc. Apparently they see, in the wider jurisdiction, an effort by the unions to escape the provisions of such laws as Taft-Hartley. And the attorney general says that the refusal of the management people to go along is a failure to secure that "agreement," set out in the Defense Production Act, as necessary to validate any policy the President proposes.

What is to be done? One group of presidential advisers successfully urged the White House to go ahead and set up the three-part board despite management's objections. The statutory limitation would be honored, these advisers said, simply by denying any binding force to the tripartite board's awards. That is how the thing was handled in World War II. That is how President Truman is doing it again. This end-run around what seems to be the plain intent of one of our own basic laws, appears pretty rugged handling. The whole question will come up in Congress again soon, because the disputes sections of the controlling law expire June 30.

Congress may conclude, in the end, that a defense emergency, which promises to be semi-permanent, requires something more than these hastily contrived presidential boards. Congress may explore the possibilities of a statutory board, staffed exclusively by *public representatives* who would work according to a clear pattern laid out in the law.

REA Allots $649,000 to Georgia Company

The Rural Electrification Administration on Apr. 11 approved a loan allocation of $649,000 to the Planters Rural Telephone Cooperative, Millen, Ga., for improving and providing telephone service in Effingham, Screven, and Burke counties.

As a nucleus, the cooperative will acquire and rehabilitate facilities of the Effingham Telephone Co., Guyton, consisting of magneto exchanges at Guyton and Pineora with 20 miles of line serving 211 rural subscribers.

REA funds will finance the acquisition and rehabilitation, and will also enable the cooperative to construct 696 miles of new line to serve 1,665 additional rural subscribers, install three new dial exchanges, and convert the existing facilities to dial.

When expansion and improvement made possible by this loan are completed, the cooperative will operate a dial telephone system serving 1,876 rural member-subscribers over 716 miles of line.

FPC Original Cost Theory Upheld

Because the Federal Power Commission and the Federal Communications Commission see so much alike in the matter of rate base determination, a recent decision of the third U. S. Circuit Court of Appeals is worthy of note to the telephone companies as well as to the gas and electric companies. In other words, if the FPC is finally upheld in its more extreme view of original cost accounting for rate-making purposes, it is a cinch that the FCC will not long hesitate to apply the same measuring stick on the telephone companies when a rate case arises.

Of course, the original cost concept has long been entrenched in both the FPC and the FCC. But this latest case, which comes from Pennsylvania and involves the Pennsylvania Electric Co., gives a bit of an added twist to the original cost doctrine. In a word, it means that original cost does not necessarily start with the cost of a utility property to the company which owns it at the present time. According to the FPC theory, original cost goes all the way back to the time the property was first dedicated to public service.

In this case the Pennsylvania Electric Co. acquired three small companies in Pennsylvania for $300,000, which was $163,951.86 in excess of their depreciated original cost, based on the time when the facilities were first put into public service. The FPC in recent years has strictly adhered to the policy of treating such excess costs as an "adjustment item."

But the company complained in this case on the grounds that the price paid for the property was the result of arm's-length bargaining with the former owners and should be treated as a test of their true worth for accounting or any other purpose. The U. S. Circuit Court of Appeals, in an opinion by Judge Kalodner, disagreed.

The court justified the FPC's refusal to recognize any added value over the "aboriginal cost" in the following language:

". . . Penelec (Pennsylvania Electric Co.) . . . attributes the difference between the depreciated original cost and the purchase price to the earning power of the properties, enhanced by contemplated operating economies and increased load and revenue. Nevertheless, Penelec failed to show how it expected to achieve any noteworthy operating savings. And its evidence as to increased load and revenue was not compelling, particularly since the customers of the selling company would enjoy material rate reductions as a result of Penelec taking over, and the opportunity for growth is limited since the service area of the three companies was surrounded by the service area of Penelec. Finally, the earnings of the lessee of the three companies that would now

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TELEPHONE SERVICE and JAPAN'S RECOVERY

- English Language Telephone Service. An enormous help during the Korean War, it will solve a problem for foreign tourists.

By HOWARD F. VAN ZANDT

PART VI

IMAGINE, if you can, what would happen in your community if several thousand foreign troops were settled among you. As a telephone executive, what would you do if neither the commandant, nor his troops spoke your language—and you in turn could not understand his—and he demanded telephone service?

That is what happened in over 100 communities in Japan when the American, British, Australian, New Zealand, and Indian occupying forces commenced their assignment in 1945 and 1946.

Wars in Europe and the occupations that often followed presented problems in language, but they were not comparable to that of Japan, because interpreters were relatively numerous, and the languages enough alike so that it was possible for both the conquered and the victor to learn each others' tongue. In Japan, it has never been possible throughout the Occupation to find enough interpreters for Allied Force needs, and the language has proven to be so complicated that only one Caucasian-American in 5,000 has been able to use it competently.

To understand fully the seriousness of the language problem, a few words about Japanese are necessary. There are two languages used by the Japanese. *First*, their own native spoken language, which is unlike that of any other race on earth, and *second*, their written language, which is principally made up of Chinese characters each of which has many pronunciations peculiar to Japan, and many meanings. The Japanese spoken language is different from Chinese in both vocabulary and grammar. The Japanese written language, on the other hand, although it employs Chinese characters, mixes them with characters of Japanese invention, and as a consequence the Chinese cannot read Japanese. There are over 40,000 characters, and so difficult are they to learn that even college trained Japanese are rarely able to write over 2,500 or 3,000 without consulting a dictionary. It is extremely rare for an Occidental living in Japan to learn any.

With the Occupation Forces were a number of Nisei (Japanese-Americans) who served as interpreters. A small percentage of them could read Japanese. Helping with the interpreting tasks were natives who could speak English. About one Japanese in 2,000 was found to possess this ability in some degree. Only about one in 100,000, however, was really fluent. Realizing the shortage of interpreters, many members of the Occupation Forces tried to learn to speak some Japanese. Hardly any tried to learn to read and write it. So difficult was the language that of those who started courses in spoken Japanese, only about 2 per cent succeeded in completing even six months of work, attending classes only two nights a week!

Those members of the Occupation Forces whose duties involved dealings with Japanese educators, Christian clergymen, foreign traders, proprietors of foreign hotels, officials of shipping companies, and ex-diplomats were often able to find among them people who could speak English without needing the assistance of interpreters. The telecommunications advisors on MacArthur's staff, however, almost invariably had to conduct their business through interpreters, for Japanese telephone people, prior to the Occupation, with a few notable exceptions had not found it necessary to learn English. In the big cities where there were foreign communities the local service was for the most part dial operated, with dial plates marked in Arabic numerals. Inasmuch as only a minute percentage of the long distance calls carried over the telephone system were placed by foreigners, it did not seem necessary to provide facilities for these calls to be handled in English. When Occidental residents of Japan wished to place long distance calls, they used an interpreter both to file the calls, and to talk to the operator hours later when the connection was being established. This was a nuisance, and expensive. It also gave the Japanese "thought police" an opportunity, through the interpreters, of keeping tab on foreigners, for the interpreters had to be present during long distance conversations in order to translate remarks made by operators, and to re-

Unvarying cheerfulness and happiness characterize Japanese telephone operators. Gradually English speaking Japanese girls have replaced American operators serving Occupation Force switchboards in Japan. During the transition from American to Japanese operation girls of both races worked side by side in complete harmony.

establish service following cut-offs—which were common.

When the Occupation started, since Japanese operators could not speak English, and there were, quite obviously, not enough interpreters or Japanese-speaking members of the Allied Forces to handle the traffic, it was necessary to set up an independent toll system, separate from the domestic system. This was done by sequestering a portion of the Japanese net work, and terminating the circuits on military long distance switchboards served by American operators.

There were Occupation Force units in all parts of Japan. To have provided toll circuits between each of the 100-odd cities occupied by important Allied units would have required an enormous toll line construction project, for there weren't enough channels in the Japanese system to permit this. Instead, a system was set up in which there were channels from GHQ to Sixth and Eighth Armies, from the armies to the corps, from the corps to the divisions, etc. Channels were set up between adjoining units, and between units in the same divisions. The Air Force also had its net work. This system when originally set up was the best that could be devised quickly, however, it had some weaknesses.

It did not provide satisfactory means whereby calls could be made to points beyond the Occupation Force network. There were 7,800 telephone exchanges in Japan. There were only about 100 where there were military occupying units. Occupation Force business required that calls be made to, or received from thousands of Japanese exchanges where there were no Signal Corps operators, and to which there were no sequestered toll circuits. Another weakness was the system used in completing calls to distant points within the Occupation Force network itself. A call, for example, from Eighth Army Headquarters in Yokohama to Niigata was routed from the army switchboard in Yokohama to the corps switchboard in Sendai, then to a regimental switchboard in Yamagata, and from there across Honshu to Niigata.

In training Japanese telephone operators to pronounce English properly, it was necessary to prepare phonograph records giving the correct "American" pronunciation of telephone phraseology. These records were sent to the operator language training schools in all parts of Japan, and played for the student operators to hear and imitate.

It took time to set up such calls, and multiple switching led to poor transmission, and many cut-offs. There were two obvious solutions to the problem, viz: (1) Spending enormous sums of money in providing an adequate and efficient military long distance system, or (2) devising a means of using the extensive Japanese toll network to supplement the army system. With an eye to the interests of the American tax-payer, the latter course was chosen. It meant either training army operators to speak Japanese, or Japanese operators to speak English. The latter course seemed to be the least difficult, yet it could not be regarded as promising in view of the problem Japanese universally had in learning to pronounce English, and to understand it when it was spoken rapidly over the telephone.

In March, 1946, a program to train Japanese to handle army traffic over the Japanese network was undertaken in Yokohama, Tokyo, Sendai, Nagoya, Sapporo, Kyoto, Osaka, and Kobe. To the extent possible, girls were chosen who had had previous training in English. Since English instruction had not been offered in Japanese schools during the period 1939-1945, the number of young women available who knew something about English was very

A class of Japanese telephone operators in Osaka learning to speak English. There are now 6,000 Japanese operators who have been trained to handle English language traffic. These girls not only serve the Allied Forces, but also handle the calls placed by members of the foreign business community in each of the large cities.

small, and for the most part even those who were available spoke it only as well as Americans do French who have had a year or two of it in high school, and then not used it for six or eight years.

After from six weeks to three months of intensive "brushing up" in English, the girls were given instruction in operating special positions of switchboards designated, in each of the cities listed above, to handle Allied Forces traffic. These positions were, in most instances, a part of the regular Japanese toll board, and had access to all the toll circuits that could be reached by regular Japanese long distance operators. A telephone number, for example 249, was designated for these special positions, and all Allied Force personnel directed to call this number if they wished to communicate with any except points which could be reached from the Signal Corps operated army toll boards. Also, if people called the army toll board, and found circuits busy to the city they were calling, they were referred to the Allied Forces positions on the Japanese board where the English-speaking Japanese operators would connect the call, using Japanese network toll circuits.

Japanese toll circuits were usually overloaded handling their own traffic, so a special priority was given to Allied Forces (AF) calls. Although no Japanese calls were interrupted to handle an AF call, at the conclusion of a Japanese call, the AF call was next in priority for handling. After about six months of experience with the service, an instruction manual was issued for the Japanese operators. One of the features of this manual was a list of Japanese city names *as customarily mispronounced by the Occupation Forces.* It had been discovered that although the operators could, in time, learn to understand simple operating phrases spoken in English, it was difficult for them to understand their own Japanese city names as mispronounced by Allied Force personnel!

Training both in operation and in language was improved in 1947, 1948, and 1949. A series of language and operating practices were issued in English, and phonograph records, giving the pronunciation of all the words and phrases, were prepared and sent to the training centers which by this time numbered over 50, for the service had been extended to 106 cities where there were army installations, and they were in all parts of Japan.

Initially, the operators who learned English were used only at the special Allied Forces positions at the Japanese

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Japanese telephone operators are now handling traffic in English at all Occupational Force switchboards in Japan. In addition, Japanese girls have been given enough instruction in "telephone English" to be able to take care of emergency calls placed in English over Japanese paystation switchboards in the principal cities where there are large numbers of foreigners. Americans calling "Ambulance," or "Fire," or "Police" are immediately connected to the proper numbers.

Mr. Van Zandt discussing some of the fine points of operating before a group of Japanese women learning to handle traffic in English. The sign on the blackboard states in both Japanese and English: "Please speak slowly." This was one of the phrases Japanese operators used most often in handling calls for Americans.

The three Japanese operators seated next to Mr. Van Zandt were outstanding members of their English language class. The Japanese gentlemen standing are officials of the Kinki Bureau of Telecommunications at Osaka, and instructors in the English class. Tourists from foreign countries no longer need worry about getting stranded in Japan due to the language difficulty, because English speaking operators are available in every important city and tourist resort area. These girls handle not only local and long distance calls, but also accept overseas calls.

PART I

Employe Training

By FRANK E. LEE

[EDITOR'S NOTE: *During World War II the Illinois Institute of Technology offered several telephone training courses. This program was inspired by and grew from the efforts of Mr. Lee, who prepared and taught the course on basic fundamentals. This course served as a proving ground for certain fundamental training ideas.*

In addition, Mr. Lee gained invaluable experience in a progressive training school of a midwest operating company and has been in a most advantageous field position to observe the final results of training school efforts. These articles on training procedure should prove invaluable to many operating companies who are planning extensions of their training programs.

The articles in Mr. Lee's "ABC of the Telephone" series, appearing currently in TELEPHONY, *have been prepared as a training text. Because of a large demand for reprint copies, the first 41 chapters of this series have been reproduced in two booklets, "ABC of the Telephone," Volumes I and II.*

Many operating companies are using the ABC books in their training programs. Other companies who are planning training activities will do well to investigate the ABC books for use by their employes.]

* * *

THE primary objective of any training program is efficiency in over-all job operations. Training, therefore, should be considered as a means to an end and not an end in itself. Think about the job when training is being planned, and when training is under way, bear in mind the requirements of the job.

A good training program must be planned properly and executed correctly. This execution of the plan is merely the application of a planned technique. Once formulated, the carrying out of a training plan is more or less a production operation. In this production of training, proven technique and methods are applied to carry the program forward. Careful supervision is required to be certain the plan is on course and striving to attain the program's objectives.

What is to be included in the training program is developed in the planning stage. Planning is carried through the program as text and lesson work is developed. Unless a fine degree of proportion is obtained between questions of theory and practice, the training plan will fall short of the objective goal. Over-emphasis on mechanics will leave students and craftsmen with a lack of knowledge of why they must do certain things. Without a reasonably full insight as to why a job must be done, a person may lose the zest required to do a good job.

Suggestions will be made in this series to illustrate how technical training can be combined with the mechanical or practical training. This plan is geared to the requirement of getting students into production at the earliest possible moment. Good training of telephone craftsmen is always a necessity—in this time of grave national emergency such training is even more important to maintain good telephone communication under any circumstances.

Many telephone companies are exploring the art of training. Old concepts and ideas are being closely examined and readjusted. New thoughts are being incorporated into the working plans of many companies. Some groups are delving into the possibility of instituting a training program to meet present-day needs. The purpose of these articles is to assist in modernizing existing plans and also to assist in the preparation of new programs.

Establish Training Program Objectives

Every program must have a goal of attainable objectives. The entire learning job cannot be completed in the training session. Practical experience, plus continued on-the-job training is needed to complete the training cycle.

A salient feature of an objective training program is based on fundamental ideas of learning. The student, who actually is a future craftsman, should be taught fundamentals that will help him develop his own job knowledge. Basically, this type of training helps the individual make the best use of any available job information.

As an example of fundamental training, consider the new employe who must be trained as a station installer. As a general rule, nothing should be taken for granted in planning the training program. For this reason, typical skills which must be developed are as follows:

(1) How to use specifications.
(2) Use of certain tools.
(3) Fastening devices.
(4) Identification of equipment and material.
(5) How to handle wire.
(6) Placing wire and equipment.
(7) Terminating wire and cords.
(8) Line protection.
(9) Interpretation of instrument wiring plans.
(10) Fault locating.
(11) General circuit layout.
(12) Service order procedures.
(13) Working on subscriber's premises.
(14) Safety.

In practically all cases, a new employe demonstrates certain aptitudes for telephone work before he is engaged for the job. However, he usually is lacking specific information, and the training program cannot hope to supply all his needs. The new employe requires fundamental training to help him develop and think for himself on the job. Thus, the objective of a new employe training course should be to help the craftsman gain fundamental knowledge of the job.

At the Illinois Institute of Technology, in the course "Basic Telephonic Communications," conducted during the last war, training in the fundamentals of specifications was stressed. A text on each topic was prepared especially for those who were new to the technical phases of telephony. Conference discussions were planned to draw out answers which were found in the text material. Laboratory work required the actual solution of problems set forth in the text material.

The actual training program moved forward as follows:

Students received a course outline which gave them weekly assignments for the entire course. Each week the group read and studied the assigned text material. Inasmuch as the schedule called for two and one-half hours of classroom work a week, the program was arranged for two evenings each week. The Tuesday evening session consisted of a one-hour lecture period. During this period the instructor lectured on the text material. A large number of blackboard illustrations helped to stress key ideas of the lectures. When available, motion pictures or slides were used to present information through a different medium. As a general rule, the picture was shown once, a discussion was con-

ducted, and the picture was re-shown. In this manner the student was able to grasp and retain more of the lesson.

On Thursday evenings a half-hour period was devoted to conference discussion. The instructor served as the leader to encourage group participation in conference activities. Through careful observation of conference techniques, the group's attention was kept focussed on questions to assist in crystallizing information. The students were helped to formulate answers and to express ideas and opinions. This type of training helps to uncover and correct wrong interpretations. Also, these methods help to build the student's confidence in what he has learned.

A one-hour period of laboratory work followed the conference session. The laboratory work helped to prove whether or not the student had learned the fundamentals of each lesson topic. Further, the laboratory experiments helped the student prove to himself that the fundamentals he had learned were correct.

In any training course some means should be provided to permit the students to prove to themselves they have learned correct fundamentals. Also, this same procedure will provide a yardstick by which the teacher or instructor can determine how well he has taught. An old axiom that fits well here is "The teacher hasn't taught, if the learner hasn't learned." Actual doing of the job along with careful questioning will prove whether the lesson has been put over by the instructor and learned by the student.

What Is Fundamental Training

Fundamental training is primarily "how-to-do-it" teaching. The finesse part of the job, such as dexterity, speed, high quality, etc., will develop through use and experience and good supervision in the field. Following are short discussions of specific portions of the station installer training program.

Topic — How to Use Specifications. An explanation should be given of what specifications are available for the job at hand. The location, indexing, and filing arrangement of these specifications should be covered. To familiarize the student or learner with the specifications, read and discuss certain pertinent sections in detail. A key section, such as drop installation for a station installer, would be most appropriate as training material for this topic. By using key items of required job knowledge as subject material in teaching the fundamentals of using specifications, a second benefit is

FRANK E. LEE

gained. This additional benefit is detailed information on a particular important part of the job.

The prime advantage in fundamental training in use of specifications is to encourage such use of this and related material. The learner should not be expected to remember a host of details when first introduced to a job. Details will come later. If the learner knows where to find specification material and how to use it he will be able to develop his own knowledge. Thus, he will be able to seek out answers to many of the questions that may arise.

Once a student has learned to develop himself through the use of specifications he is well on the road to becoming a skilled craftsman. Specifications are always available. Personal supervision or advice from others may not be available when most needed. For this reason, class-room training should be planned to stress the fundamentals of using specifications.

Topic — Use of Certain Tools. In practically any telephone training course, instruction must be given in the use of certain tools. In the station installation program, a few representative tools are:

(1) Screwdriver.
(2) Various pliers.
(3) Drilling tools.
(4) Splicing tools.
(5) Tree pruning equipment.
(6) Climbers and safety straps.

For all of these tools there are fundamentals of proper usage which should be discussed in the training session. One item may be the selection of the proper size tool for a particular job. A second item could be how to hold the tool for the safest and most efficient use. Proper maintenance of the tool could be a third item. Storage and carrying from job to job may be a fourth topic.

Fundamental training in the use of tools will reduce tool expense, increase efficiency in the field, and will help make the job safer. Because of these benefits the use of tools should be given careful consideration in any telephone training program.

Topic — Fastening Devices. Fastening devices used on the telephone installation job lend themselves well to the fundamental training idea. There are several ways to approach this idea. First, an exhibit could be prepared to show what fastening devices are used on different types of surfaces. Next, fastening devices could be associated with the particular job operation. Then, as classroom work progresses, demonstrations can be given to show how the various fasteners are used. Finally, as a test or check, the student should demonstrate how the fastener should be used.

Typical fastening devices are:

(1) Screws.
  (a) Style
  (b) Size
  (c) Material
  (d) Where used
(2) Screw anchors.
(3) Toggle bolts.
(4) Bridle rings.
(5) Drive rings.
(6) Insulated rings.
(7) Inside wiring nails.
(8) Cleats.
(9) Knobs.
(10) House attachments.
(11) Pole hardware, etc.

Practically, any job can be broken down into fundamentals. Actually, selection of material to use for fundamental training centers around the question of what must be known to do the job. This means train well in essentials. In this way the student can get on the job sooner and begin earning his own way. Training in essentials helps the new man gain confidence. He will develop with experience, but in the meantime, he will have enough job knowledge to permit going ahead under practically any given set of circumstances.

(To Be Continued)

V V

"The institutions founded by the early settlers of New England were distinguished by their practicality. Escaping, as the Founding Fathers had, from a tyrannical government imposed from above, their first move on being faced with the problems incident to living together in a new country was to give everyone a voice in decisions. This reliance on the integrity and common sense of the individual lies at the base of the American way of life."—Radford (Va.) News-Journal.

telephony's *SAFETY* bulletins

No. 25—MAKE THE LADDER SECURE. In any job operation there is a place where safety starts. This bulletin tells how to make a ladder secure before climbing begins.

by FRANK E. LEE

THE start of the longest journey is but a single step, and so it is with safety. Safety on any job starts with a seemingly insignificant detail. Especially is this true where extension ladders are concerned.

What is the first step to ladder safety?

A secure footing is most essential. The ladder should be planted firmly on the ground. Sharp ladder spurs help the weight of the ladder dig in for a sure grip on the ground. The careful workman will make sure the ladder is placed on level ground.

After the ladder is placed the footing should be tested. Grasp the side rails and, with one foot on the ground, put weight on the bottom step with the other foot. This test will eliminate any chance of the ladder slipping or tilting when actual climbing begins:

A secure footing will hold the ladder firm during the entire work operation. If the footing is insecure the ladder may slip or jerk while the workman is in a working position on top of the ladder. These sudden shifts of a ladder are major causes of ladder accidents. Thus, the first step to ladder safety is a firm, secure footing.

Occasionally an extension ladder has to be used on a smooth concrete floor. On this kind of a surface even the sharpest spurs merely ride the surface. The holding power of the spurs is reduced to two or four sharp edges of metal. Chances are the ladder will not support itself under these conditions. As a result, climbing a ladder under these conditions is rated as a first degree hazard.

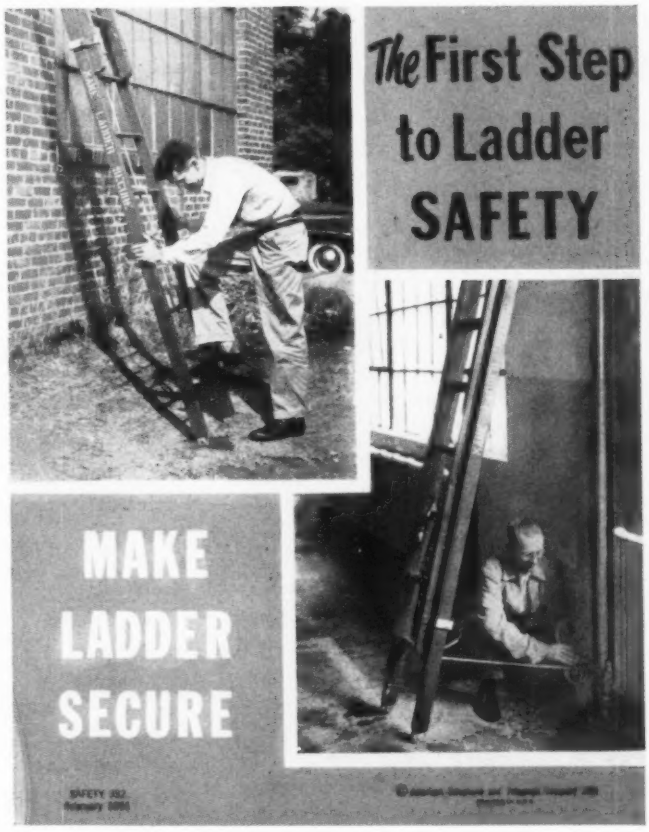
The answer to this problem lies in making the ladder secure. There are a number of ways in which this can be done, such as the following:

(1) Tie the foot of the ladder to a substantial object, such as a pipe.

(2) In a garage where automobiles are parked, place the ladder against the wall and brace with the bumper of a car. Have the necessary auto or truck pulled forward the required distance, carefully set the brakes, and a firm ladder block is provided.

(3) Several types of anti-skid ladder shoes are available on the market today. On a dry concrete floor these are most effective. However, these shoes should not be expected to provide a firm footing on a greasy or oily floor.

(4) Where other support cannot be provided, arrange



for someone to hold the ladder. To hold a ladder, a foot should be pressed or wedged against each ladder rail. Grasp the ladder rails firmly with each hand. Maintain this position as long as someone is on the ladder.

Whenever the ladder is near a traffic aisle or will not support itself, someone should remain on guard at the ladder as long as it is erected.

These safety rules should be observed every time a ladder is used. Only one slip is needed to cause a serious ladder accident. Take time to eliminate the chance of a ladder slipping. Take the first step to ladder safety—make the ladder secure.

Remember—YOU HAVE TIME FOR SAFETY.

"With taxes steadily increasing on all levels, local, state and federal, it becomes more necessary than ever that we choose wisely those things for which we shall and shall not spend our money. . . . The average tax load per family today is equal to about $2,137 as compared to $360 in 1939."—Bristol (R. I.) Phoenix.

• • •

"There is no end but ruin when dealing with inflationary spirals, except they be dealt with summarily. . . . The politicians have demonstrated in this field, as they have almost universally in other fields, a freakish incapacity to grasp what happens."—Palm Beach (Fla.) Post.

MAINTENANCE TESTING EQUIPMENT

By JOHN A. BRACKEN

IN THE operation of a common battery manual telephone exchange, supervision on a pair of switchboard cords is accomplished by means of either electromagnetic devices or small incandescent lamps. The lamps are superior to the electromagnetic type supervisory signals in that mechanical operating adjustments are not required.

The purpose of the supervisory signal in the switchboard cord circuit, is to indicate whether or not the customer's line is in use, and to denote to the operator that the handsets have been replaced in their cradles at the calling and called stations.

In *Fig. 1*, the supervisory signal lamps are controlled by means of relays "A" and "C." When for example, the "A" cord is in use, the "A" relay having its winding in series with the ring conductor of the cord, battery will flow through this winding and operate the "A" relay. Operation of the "A" relay connects a shunt resistor "SR" around the supervisory lamp "L."

The shunt resistor is non-inductive and comprises a subsidiary circuit by means of which most of the current flowing in the main circuit to the lamp is turned aside and passed around the lamp. That is, battery current on the switchboard cord sleeve conductor is divided, flowing partly through the "SR" resistor and partly through the lamp "L," then to ground at the line jack sleeve, thereby causing the lamp to become so dim that it is not visible to the operator and thus indicating that the customer has not released the line.

When the conversation is completed and the customer replaces the handset in its cradle, the supervisory lamp "L" lights because of the fact that the line circuit is opened at the customer's station and battery ceases to flow through the winding of the supervisory relay "A," allowing the relay to release its armature and remove the lamp shunt due to breaking the relay contacts "C T" and allowing the supervisory lamp "L" to burn brightly. This signifies to the operator that the line circuit has been released.

To test for failure of the cord circuit supervisory signal by means of the test set referred to in Part 37 (TELEPHONY, Feb. 10, p. 28, *Fig. 1*): First, prepare the test set in accordance with items one, two, three and four as stated therein. Now proceed as follows:

PART 39. The foregoing article in this series appeared in the Apr. 7 issue, p. 20.

(a) Connect the test set cord sleeve conductor test clip to the sleeve of a switchboard cord other than the one in trouble and obtain a milliammeter reading of the value of the current flowing. This is for the purpose of comparison with the faulty cord. Assume the supervisory lamp lights and that the meter reading is 0.080 ampere or 80 M.A.

(b) Disconnect the test clip from the switchboard cord sleeve and touch the test clip to the sleeve of the defective cord. If the supervisory lamp does not light and a reading is obtained on the test set meter, it is possible that the armature of the supervisory relay is pulled up from a previous operation and is stuck, or the relay contacts are out of adjustment and held closed, thus shunting out the supervisory lamp. In this test the meter reading should be greater than 80 M. A. If no reading is obtained on the test set meter, it is indicative of an open in the cord sleeve circuit.

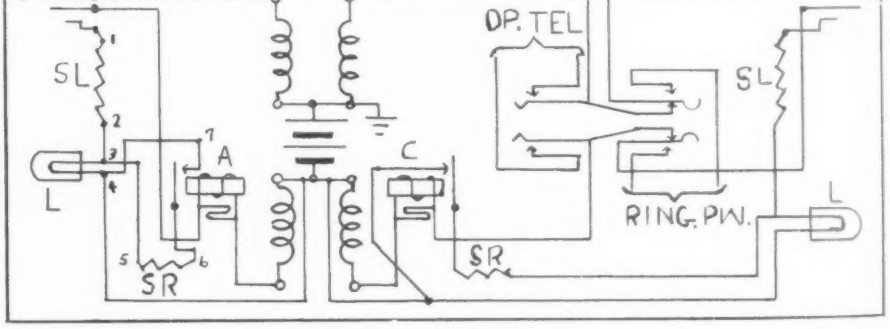


Fig. 1

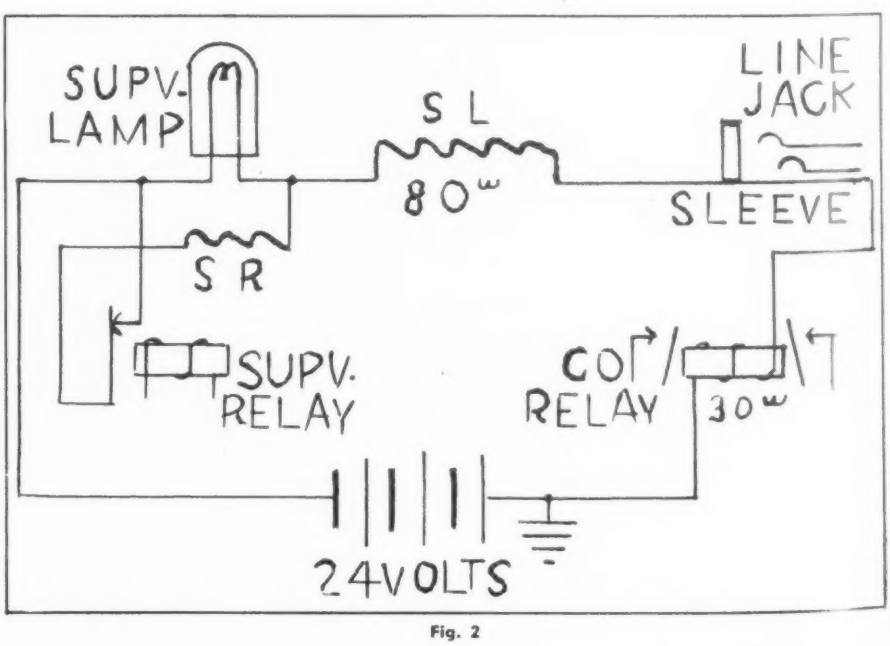


Fig. 2

(c) To test for an open sleeve, first determine if the faulty cord circuit fuse is O. K. If so, touch the test cord clip to the following points as shown in *Fig. 1.* Terminals 1 and 2, respectively, of the cord circuit sleeve resistor (SL), then terminals three and four at the supervisory lamp, etc. At some point a reading will be obtained on the test set meter and, between this point and the point no meter reading is indicated, the open will be found.

A case of "no supervisory signal" may be caused by the ring and sleeve conductors of a cord being crossed, either in the plug or at the cord fasteners inside the switchboard. To test, touch the test cord clip to the sleeve of the defective cord. The test set meter should show a reading and the supervisory lamp may light for an instant and then go out owing to battery flowing through the supervisory relay to the cord ring conductor, through the cross and to ground at the test set, thus operating the relay and shunting the supervisory lamp.

Occasionally a cord circuit supervisory lamp will remain lighted while the cord is in use, due to the shunt around the lamp being open, an open in the wiring, the supervisory relay contacts not making when the relay is operated, or the shunt (SR) resistance being too high. To locate an open shunt, touch the test cord clip to terminals five and six respectively of the shunt resistor (SR), then block the relay operated and touch point seven, etc. At some point the supervisory lamp will light and the test set meter needle will be deflected. The open will be found between this point and the point last tested.

To determine if the shunt (SR) resistance is too high: (a) Consider the complete operated path of the cord circuit sleeve as shown in *Fig. 2:* (b) assume that the combined parallel resistance of the supervisory lamp and shunt (SR) is 34 ohms as shown in *Fig. 3.* What should the resistance of the shunt be?; (c) by formula: R2 = R1 R3 ÷ R1 — R3, or 210 × 34 ÷ 210 — 34 = 40 ohms; (d) with the supervisory relay released, measure the resistance of the shunt (SR). It should be about 40 ohms as calculated above.

Referring again to *Fig. 2,* with the supervisory relay unoperated, current will not flow through the 40-ohm shunt and there is a straight series circuit of 210 + 80 + 30 = 320 ohms. The value of the current flowing is by Ohm's Law equal to I = E ÷ R, or 24 ÷ 320 = 0.075 amperes.

When the supervisory relay operates, the combined parallel resistance

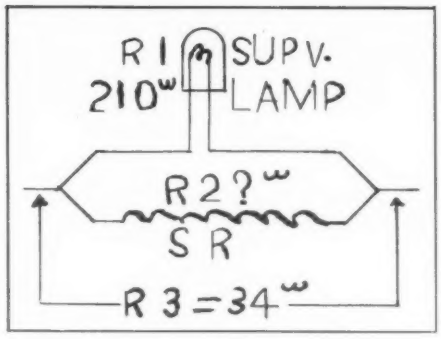


Fig. 3

of the lamp and shunt is by formula: R1 R2 ÷ R1 + R2, or 210 × 40 ÷ 210 + 40 = 34 ohms. The complete series resistance of the circuit now equals 34 + 80 + 30 = 144 ohms. The current flowing equals 24 ÷ 144 = 0.166 + amperes.

In the first case, the current flowing is 0.075 ampere, and to find the EMF drop across the lamp, again apply Ohm's Law, where E = I R, or .075 × 210 = 15.75 volts. It was found that the parallel resistance of the supervisory lamp and shunt is 34 ohms and the total current flowing in the circuit is 0.166+ ampere. The EMF drop across the 34-ohm shunt will, therefore, be .166 × 34 = 5.6 volts and is the voltage drop across either the 210 ohm lamp or the 40 ohm shunt.

Under this condition the current passing through the lamp is no longer .075 ampere nor is it the whole of 0.166+ amperes. However, it may be determined by Ohm's Law using the EMF drop across the lamp alone, or 5.6 ÷ 210 = 0.027 — ampere and is the current in the lamp, which is insufficient to light the lamp.

If the shunt resistor (SR) is suspected of being short circuited, a very simple test is to first block the supervisory relay in its operated position, then touch the test set cord sleeve conductor test clip to the sleeve of the cord to be tested. Note the meter deflection and repeat the test on several adjacent good cords, noting the deflection on each one.

If the suspected cord shows a meter reading greater than the other cords, this will indicate that the resistor is short circuited. It is a case of trouble that can be easily overlooked, because it does not outwardly affect any part of the cord circuit, and is not discovered until a test for it is made.

In those telephone exchanges in which an electromagnetic mechanical supervisory signal takes the place of the lamp, the signal is connected in series with the ring conductor of the switchboard cord, and from this it may be seen that when a telephone station is connected with the cord, the signal is energized and its armature operated. In this case the action of the mechanical signal is opposite to that of a supervisory lamp, the mechanical signal being displayed when the customer is talking, while the supervisory lamp is out when the customer is talking.

With the mechanical signal an open may be located in the same manner as described above for opens in supervisory lamp circuits, but if the signal is short circuited, it may be ascertained by simply obtaining the current flow value through the winding of a signal in an unaffected cord circuit and which is compared with that obtained through the faulty signal. If the latter signal is short circuited the test set meter reading should be considerably higher than that shown with the good signal.

(To Be Continued)

V V

Warren, Ohio, Company's New Toll Building Ready May 1

The Warren (Ohio) Telephone Co.'s new $350,000 building housing new equipment which will almost double its toll facilities will be ready for occupancy about May 1, it has been announced.

A new toll board containing 40 positions will replace the present 22-position board when the new equipment goes into operation.

Plans are also under way for the construction of an exchange in the northeast section of the city and to double the size of the present Leavittsburg exchange.

Last year the company completed 1,363,174 calls or 20 per cent more than in 1949 when 1,174,366 were completed. This compared with 1,113,480 completed calls in 1948.

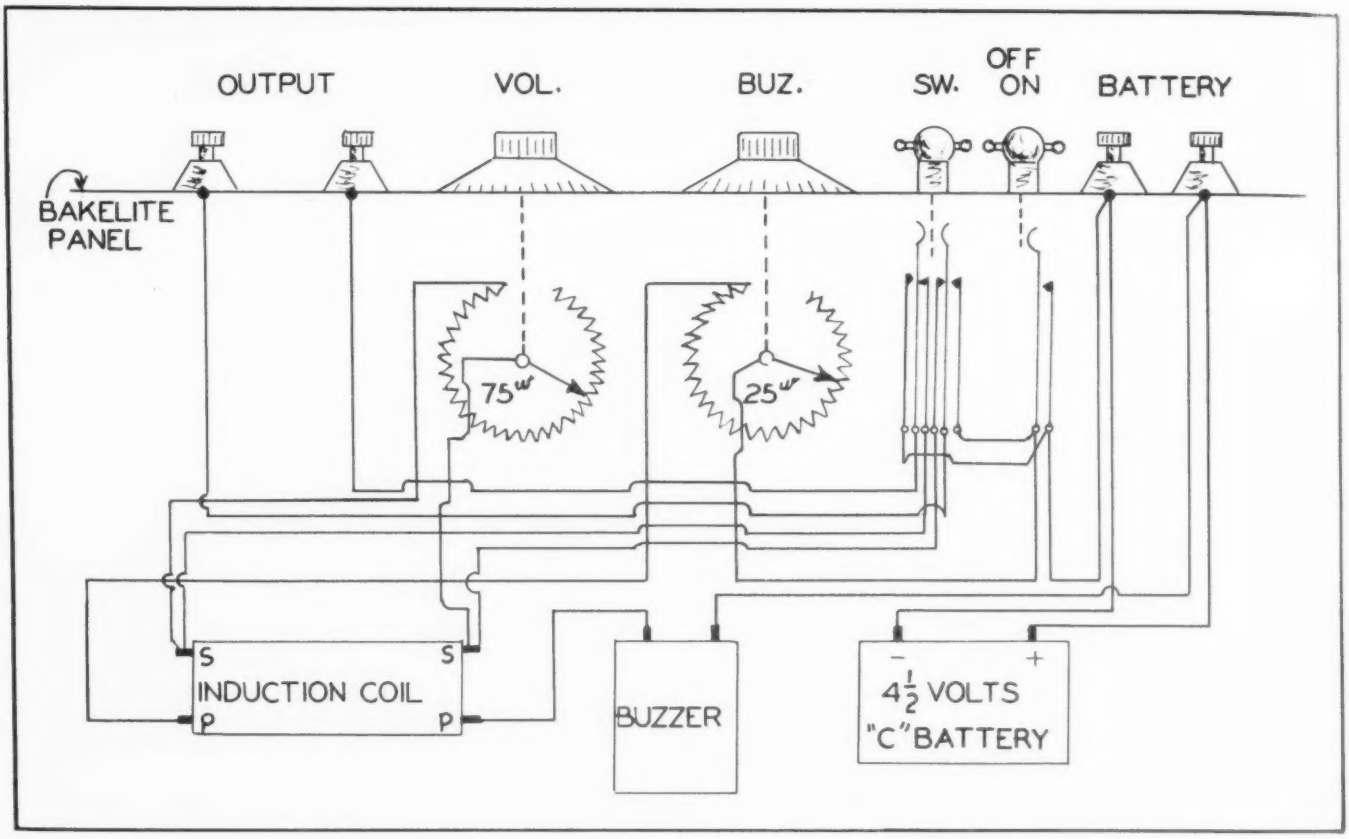
The telephone company now has approximately 26,000 subscribers which represents a gain of almost 2,000 in 1950.

The daily average of long distance calls at the present time is 4,500 as compared with 2,500 to 2,700 during the war, according to company officials.

Last year the company installed toll dialing equipment at Warren to expedite handling of calls to distant points at a cost of $60,000.

V V

"We are reaping an unsavory harvest. For years we have been demanding more from government. For years we have been ignoring our responsibilities to government. The two do not go together. If we want government to provide greater and broader services, we must expect to pay the piper."— Canandaigua (N. Y.) Times-Journal.



A TEST SET WITH MANY USES

By L. N. MARTIN
Virginia, Ill.

EVERY telephone central office should have testing equipment to use in locating trouble and for making routine tests of the switchboard and other central office equipment. If the office is large, or if it is owned by a company which operates a number of large or medium-sized offices, many types of test sets such as transmission measuring sets, noise measuring sets, resistance bridges, impedance bridges, current flow sets, etc., are usually available.

The smaller office, however, cannot justify the purchase of these instruments, some of which are quite expensive. The purpose of this article is to describe an inexpensive "home made" test set which has many uses and which can be justified even in a one-position magneto office.

The set may be assembled in any suitable small box, preferably with a bakelite panel forming the top or the front. In the accompanying sketch the equipment shown above the line, which represents the bakelite panel, is on the outside of the set and consists of four binding posts, two dials, and two key handles. Within the box there are two rheostats, two keys, an induction coil, a buzzer and a 4½ volt dry battery. The induction coil is preferably of the type used in a magneto telephone.

The other items making up the set can be purchased from a telephone supply house. The resistance values of the two rheostats are optional as will be explained later. The buzzer should be small, high pitched and of good quality. Its contact should have an adjustment screw and it is well to mount the buzzer in such a position that a hole may be drilled through the panel or the side of the box through which a screwdriver may be inserted to adjust the buzzer. The type of wiring used within the set is immaterial but a laced form makes a neat job. A variety of colors should be used so that no two wires brought out at the same stitch will be the same color.

Now let us trace the circuit. When the "SW" key is in the position shown and the "Off-On" key is closed, we find that the battery, buzzer, primary winding of the induction coil, and the 25-ohm rheostat are in series and the buzzer will operate continuously. (The 25-ohm rheostat is not absolutely necessary but will aid in adjusting the buzzer to the desired tone.) The secondary winding of the induction coil will now reproduce and amplify the tone produced by the buzzer and this output of the secondary winding is available at the binding posts marked "Output."

The 75-ohm rheostat is bridged across this output and is probably the most important feature of the set. Its purpose is to control the volume or amplitude of the output tone. Seventy-five ohms resistance proved correct for the buzzer and coil which we used, however, the resistance of this rheostat should be such that when the dial is moved from the "open" position to its first contact with the resistance wire, the reduction in volume will be just perceptible. Further movement of the dial will gradually reduce the volume until at or near the "short circuit" position the tone will no longer be audible.

A "test receiver" is used with this test set to listen to the tone after it has passed through the equipment being tested. A test receiver is an ordinary operator's receiver with head band to which are attached two single conductor cords about four feet long. One of these cords is terminated in a

(Please turn to page 38)

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spring clip (Frankle clip) and the other in a test pick or needle.

Now let us use our test set and test receiver. True, we cannot measure a transmission loss exactly in db, but how often is this data critical in a small office? What we want to know is: Does this circuit have more transmission loss than other circuits of the same type in this board? Is this difference large or small? What causes the excess loss? More often we will be using the set just to locate an elusive "cut-out" or "fade-out."

Let us assume that a certain cord circuit is suspected of "poor transmission." This may be verified by the lower volume of tone heard through this circuit when compared to the volume heard through another cord circuit. But to be more certain we listen to the tone through a good circuit and operate the "VOL" dial until the tone is just audible and note the position of the dial. (Radio dials are usually marked 0 to 100.) We then leave the dial at this setting and test the faulty cord circuit. We find that we cannot hear the tone. We then turn the dial back until the tone is again heard and notice the position of the dial. The difference between the two readings is a measurement of the trouble and while this measurement is not in any standard unit it does tell us that one trouble is more serious than another and with a little experience the reading will tell us just what to look for in our own particular board.

At another time we may be using the set to make a routine test of all cord circuits when there is no reported trouble. We set the tone so that it can just be heard. The disappearance of the tone will then warn us of trouble in any particular cord circuit.

To locate the particular equipment causing the excessive loss, the first step is to remove any equipment which is bridged across the cord circuit—for example: A clearing out drop bridged across a magneto cord circuit. If the bridged equipment is causing the trouble, the circuit will be restored to normal or *better* when the bridge is removed. (Since any bridged equipment causes *some* loss, the circuit should test somewhat better than normal when a bridge is opened.) After all bridges have been eliminated as a cause of the trouble, follow the circuit back from the tone with the test receiver step by step alternately on a good circuit and the defective circuit. The good and bad circuits will test the same until the faulty equipment in the bad circuit is reached.

Now let us consider a case of very elusive "cut-out" or "fade-out" trouble. Perhaps we have tried to locate this fault with battery or an ordinary buzzer circuit but have failed because a battery or even a loud tone will often "freeze" this type of trouble. For this test we reduce the volume of the tone until it is just audible, then tap or jar the various pieces of equipment (such as keys) in the circuit and bend wires where they are soldered to lugs until the trouble is located.

We may have a case of "cross-talk." Again, we are not interested in an exact measurement of this cross-talk such as could be made with a more expensive set. What we want to determine is: Does the reported cross-talk exist? What circuits are involved? Is it in the open wire, the cable, or the central office? For this test use a rather loud tone. Connect it to one of the lines reported while you listen on other circuits on the same line, cable, etc. Open circuits at the cable terminal or at the main frame, etc., as required. This action will soon isolate the trouble on certain circuits and determine whether the trouble is in the open wire, cable, a particular count of the cable, or in the central office. In this connection, if grounded (one wire) lines are in general use in your exchange, some cross-talk cannot be avoided. A quantitative measurement may be made by means of the volume control which will spot some of the excessive cross-talk. Where grounded lines are in use, a poor central office ground is frequently the cause of general cross-talk.

We may wish to use a simple buzzer circuit consisting of a buzzer and battery in series for certain tests such as identifying wires. Referring to the sketch: Operate the "SW" key and leave the "Off-On" key in its "Off" position. We now have a simple buzzer circuit connected to the output terminals. The buzzer now operates only when there is a closed circuit connected to the two output binding posts.

There are a number of features which may be added to this set. The binding posts designated "Battery" are to connect an external battery in case of failure of the small battery in the set. However, the box must first be opened and the internal battery disconnected. A convenient addition would be a key to switch from internal to external battery. An external battery of higher voltage may be used for certain buzzer tests where considerable resistance is involved.

If the set is to be used on the cord circuits of boards which all have the same types of plugs and jacks, two jacks mounted in the set will prove most convenient. The tip and ring of one of these jacks should be wired to the tone output and the tip and ring of the other jack wired to two binding posts to which a receiver may be connected. If universal cords are to be tested it will also be necessary to arrange the sleeves of these two jacks so that they may be left open, connected to ground, or to ground through a specified resistance at will. A few additions to our set will provide this feature.

This set can be easily constructed by any central office man and he can build into it any additions or variations that may meet his particular needs.

V V

Three New Farm Line Companies, One Mutual, Begun in Nebraska

Three new farm line telephone companies have been organized in northwestern Nebraska—the Sparks Telephone Co., the Shadley Creek Telephone Co. and the Sand Creek Telephone Co. —to serve widely separated ranches with switching connections at Valentine with the Northwestern Bell Telephone Co. Altogether they spent $17,000 in line construction and contributed their own labor to obtain service they have never before had in a 52-mile stretch.

Under the guidance of the Small Company Task Committee of the Nebraska Telephone Association, the Elsie Mutual Telephone Co., with 135 members, each of whom has purchased stock, has been organized with W. H. Flanning as president, A. A. Hanson, secretary, and H. D. Bancroft, treasurer. A new dial system is being installed.

V V

Operators Join Police In Hunt for Desperadoes

Operators in more than a dozen southeastern Nebraska exchanges of the Lincoln (Neb.) Telephone & Telegraph Co. had the "thrill of their lives" recently when their services were commandeered by the state safety patrol.

They were asked to assist in running down three desperadoes who had escaped from an Omaha jail and were traced through stolen automobiles to that area, but who finally succeeded in getting away.

The task assigned the operators was that of alerting all farmers of the possibility of a visit from the escapees who had kidnapped two farmers earlier in their get away from Omaha and forced them to take them in the farmers' cars to another point.

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THE OPERATOR'S Corner

BY
MAYME WORKMAN
TRAFFIC
EDITOR

WHEN an applicant applies for a job as switchboard operator she may be of the opinion, "They sure expect a lot of a girl who would like to work here!" Perhaps this is true, but if the standards for switchboard operators are high in this country, they are equally so in England, according to a London firm which listed the following in an advertisement as qualities a girl must possess to be an ideal telephone operator:

"She must be friendly and pleasant, tactful and discreet, have a swift and accurate brain, a good speaking voice, attractive personality and charm, and have undergone suitable training.

"She must also learn to recognize telephone users in the company by sight, name and voice, be familiar with the products of the company and have knowledge of the part played in production by each section and department."

The firm was seeking an operator and, to measure up to its requirements, the operator, in addition to performing the work at the private branch exchange switchboard, must also have a general knowledge of the business and its personnel. No small order!

As the work of serving the telephone using public becomes more and more technical, operators must possess many qualifications to perform a satisfactory job. Take the timing of toll calls, as an example. The operator must know when conversation is considered started in order to begin timing the call at the prescribed interval, neither too soon nor too late. If the timing is started too soon, in some instances the customer will not receive the full value for the toll charge as he will be charged for a minute overtime; whereas, if the operator had started to time the call at the actual time conversation had started, the conversation would have terminated within the initial period. Likewise, if the operator is slow in stamping or entering the start of conversation on the toll ticket, the timing may be three minutes when it should have been four minutes, resulting in loss of revenue for the telephone company.

The timing of calls is an important function, as it involves a charge which affects both the customer and the company. The latter is dependent upon the revenue it receives for service and for the use of its facilities, while the customer, of course, pays the bill for service rendered. Accurate timing of long distance calls should therefore not be taken lightly.

This function is just as important in a small office as in a larger one since the same principles are involved. The practice of entering the initial period number of minutes on the toll ticket as soon as conversation starts should never be followed. This statement may seem strange to some of our readers, particularly in the larger offices, but we know from experience, some small offices do not charge their customers for overtime regardless of how long they talk. This, of course, is wrong. A customer should pay for the overtime when conversation extends beyond the initial period.

Rating toll tickets, a task that is frequently assigned to night operators, is another important function in the central office. The night operator usually rates all tickets that were not rated during the day and evening hours and also checks the rates entered by other operators.

In quoting a rate or charge, the operator should be sure to quote the correct amount. Once a rate or charge has been quoted to a customer, it is difficult to correct it if an error has been made, particularly if the error involves an increased charge for the customer.

The London firm was seeking a girl who was friendly and pleasant. Surely these are traits that should be developed on the part of every switchboard operator. If they are not, an operator is a detriment to the entire operating force as well as to the telephone company.

Tact and discretion go hand in hand in the central office. Complaints must be handled tactfully and an operator must be the soul of discretion, as she is not permitted to reveal what she may hear or what takes place at the switchboard in her line of duty, including such facts as, "Mrs. Jones called her son in New York this morning." Operators are not permitted to discuss the calls that are handled at the switchboard.

A swift and accurate brain was another requirement of the London firm. Naturally an operator must possess these qualifications, since she is required to think quickly and to grasp a situation readily, particularly in handling a call involving an emergency. An operator must be mentally alert and ever ready to cope with any situation which may arise.

An attractive personality and charm were two other qualifications that were cited by the London firm. You have only to visit any central office or to be nearby when the operators are leaving the telephone company's premises to see that our American switchboard operators can measure up favorably with telephone operators anywhere in the world, in personality and charm.

Suitable training is, of course a *must* prerequisite to performing a satisfactory job, and here again our supervisory personnel have the "know how" it takes to train the newly-inducted students.

As a whole we are proud of the operators and supervisory personnel in our American telephone exchanges and believe they can compare favorably with any. But it takes work and more work to maintain this precedent and we must be constantly alert and put forth sincere effort to keep the standards we have established. To rest on our laurels or to strike our breasts and loudly proclaim how good we are would quickly destroy our achievements. If we are humble about our accomplishments and ever ready to seek further improvement in ourselves and in our operating methods we shall not only retain what we have achieved but shall continue to even greater achievements.

Traffic Questions

(1) What entry should be made on the toll ticket when a customer requests an operator to make a report charge collect?

(2) If the operator receives a request to make a report charge collect

(Please turn to page 66)

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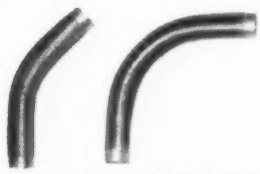

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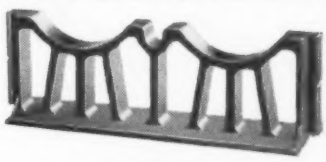
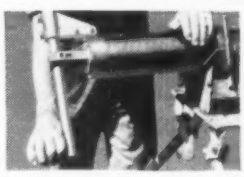
Bend Spacer Bar assures accurate alignment

Base Spacer provides a solid foundation



L-M Taper-Tool for use in field or shop, to apply an accurate 2-degree taper to salvage short lengths, cut ends. Shown with L-M Fibre Conduit Vise.



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LINE MATERIAL fibre conduit

THE PLANT MAN'S *note book*

BY RAY BLAIN TECHNICAL EDITOR

THE world's largest and busiest private branch telephone exchange is in the Pentagon Building, Headquarters of the Department of National Defense in Washington, D. C. In a normal day, 225,000 inter-office calls and 90,000 outside calls are handled through the exchange.

• • •

It has been said: "A person is often measured by the size of the thing it takes to get his goat."

• • •

In the construction of new telephone exchange buildings the placing of sleeves in the floor to carry tipping cables from the cable vault to the main frame often proves a rather bothersome task. If these sleeves are not placed accurately, difficulty is experienced in locating the mainframe later. Frequently, because of the improper location of these sleeves, the entire mainframe and cable installation are unsightly.

Fast cutting concrete hollow-core drills are now available that can be operated by an ordinary electric drill. These drills can be obtained in sizes from $\frac{3}{16}$ in. to 6 in. diameters. The 2 in. to 3 in. sizes will cut through 1½ inches of concrete per minute. These drills will cut through reinforcement rods and the hardest of aggregate.

It is believed that it would be better to pour the concrete floors in equipment rooms without bothering to place sleeves and then later drill accurately located holes for the entrance cables by utilizing this new fast cutting drill. This plan will make possible a better, neater job and probably at a lower cost.

• • •

The president of a comparatively large business informed us recently that his telephone toll bill is increasing each month at a tremendous rate. Not only do the number of calls increase each month, but also their length and cost.

It appears that the business world now finds the use of the telephone far superior to any other means of communication and that the higher cost is justified. Telephone service provides greater satisfaction than letter writing and is much faster.

We note also that frequently calls are being delayed to many localities because of circuits not being available. Even so, toll service proves most satisfactory.

• • •

Someone has said that leadership implies knowing where you want to go, how you plan to get there, and how you will help your associates to advance with you.

• • •

It is claimed that the impact of television on the family will be greater than was the impact of radio, for the appeal of the eye is generally greater than the appeal of the ear. This is especially true in the case of young children.

• • •

To show how deep-grounding can be accomplished in a simple, effective low-cost manner with sectional ground rods, the Copperweld Steel Co. has developed and put on the road a ¾-ton demonstration truck equipped with a demountable steel framework somewhat similar to a pile driver designed to support a Barco gasoline hammer for driving ground rods. This ground rod driving equipment has proven itself particularly well suited where a considerable number of rods are to be driven.

To operate this equipment, a coupling and driving stud are first screwed on the upper end of the sectional rod. With the hammer raised to the top of the derrick, the top end of the rod is inserted into the chuck of the hammer and the guide plates attached. The hammer is lowered as the rod is driven into the ground, thus keeping its full weight on the top of the rod.

In the case of deep-grounding, when the rod has been driven to the ground line, the hammer is raised and another section of rod is attached, and the operation is repeated. The driving is continued until the desired resistance is obtained.

The depth to which the rods can be driven will depend upon soil conditions in a particular locality. In some sections where the soil is predominately sandy, rods have been driven to a depth of 160 feet. In other locations where rock, shale, sandstone or limestone is encountered, it may prove difficult to drive more than one or two sections.

• • •

The writer recently had the opportunity of spending two pleasant days in the Bell Telephone Laboratories in New York City. It is indeed a pleasure to view the marvels of communication being developed and perfected by the hundreds of technicians in this unique institution.

• • •

The March cover of the *Circle*, employes' magazine for the Associated Telephone Company, Ltd., is devoted to an airplane view of Azuza, Calif., the town with the name made famous by Jack Benny on the radio.

The telephone history of the town began in 1897 when the Sunset Telephone & Telegraph Co. of Los Angeles installed a pay station in a local hotel. The pay station was connected to a toll line that later became a part of the United States Long Distance Co. This town is now served by a modern dial system with 3,100 stations in service.

• • •

Worry would not be so bad if it were not applied either too early or too late. Also, it has been conclusively proven that worry kills more people than work.

EVERY COIL OF Alphaduct DROP WIRE IS *WATER TANK TESTED BEFORE IT LEAVES THE FACTORY

You don't have to worry about insulation breakdown when you use Alphaduct drop wire. *Every* coil is tested by submersion in water for nine hours, after which an alternating potential of 1000 volts is maintained between each conductor and the surrounding water for at least five seconds. After this exacting test, every coil must have an insulation resistance of at least 3000 megohms per thousand feet.

Alphaduct is the longest wearing, most satisfactory drop wire you can use. Step-testing, during every phase of manufacture assures you your drops will last and last . . . . and last.

Every coil is dated, so you can easily check its performance for yourself. Moreover, it comes to you in Alphaduct's neat, handy carton packaging.

Alphaduct drop wire is available in twisted pair, parallel or dumbbell type, with bronze or Copperweld conductors. Try it.

ALPHADUCT WIRE AND CABLE COMPANY • MILLTOWN, NEW JERSEY

PLANT MAN'S QUIZ

Q. What method may be used to prevent sectional steel manhole forms from sticking to the concrete when removing them from a manhole?

A. If the forms are cleaned and oiled after each manhole is poured, serious trouble with sticking should not be experienced. Some construction foremen use a coating of warm paraffin on the forms, which proves effective in the prevention of sticking and leaves the inside of the manhole clean and smooth. It is also possible to cover the surface of the forms with building paper before pouring the concrete.

• • •

Q. I was particularly interested in your description of the two-man construction truck which appeared in the February 10 issue of TELEPHONY. This appears to be the type of truck we have attempted to design and build in our shops to care economically for small line construction jobs. We require that this unit be one which can be easily moved and worked over rough roads and other unimproved areas in the rural districts. Please advise whether this unit can be procured from one of the regular manufacturers at this time.

A. Practically all of the utility truck body manufacturers will be able to construct a body of this type to meet your special requirements. The conventional type chassis will need very little modification to mount a body of this type. The front mounted derrick would not present any unusual problems.

It is suggested that you consult the truck body suppliers and work out the necessary details with them to meet your particular requirements.

• • •

Q. In the repair of switchboard cords, we find it extremely difficult to solder on the tips without burning the tinsel conductors, making them brittle and causing them to break easily. Can you recommend a method of soldering to prevent this trouble?

A. Soldering of tinsel conductors is a difficult operation and we would not suggest that you attempt it. The presently accepted practice is to compress the cord tip on the ends of the cord conductors. A machine or a pair of special pliers may be used for this purpose. This type of cord tip is easy to install and gives long, trouble-free service.

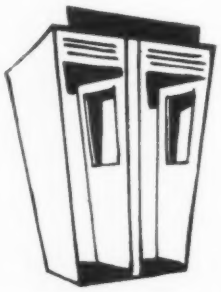
"America's

NO. 1

Sign of Service!"

The Bell System through planning, building and *service* has become more and more vital to us as individuals and as a nation.

Gladwin Plastics considers it a distinct honor to be a member of the group of organizations fulfilling the requirements of the telephone industry to steadily improve its service to the public.



Gladwin Plastic Pay-Station Signs

give service with the lowest maintenance Cost.

Write for brochure No. 5100 which will give you a complete story of Gladwin Plastic "Signs of Service" and how they build better customer relations.

Gladwin Plastics, Inc., 542 Courtland St., N. E., Atlanta, Georgia

HAVE YOU PLACED YOUR ORDER FOR

Peatrophones?

- PEATROPHONES offer the greatest opportunity for increased revenue from present subscribers since the advent of long lines:

1. It answers the telephone and delivers any message the subscriber wishes.
2. Records any message the calling party wishes to leave.
3. Repeats all messages to the subscriber when he returns to the instrument.
4. Prevents "Don't Answers" as it always answers the telephone when the subscriber wishes.
5. Permits the subscriber to leave word when he leaves his office where he can be reached.
6. Is leased to subscribers by the telephone company.
7. So simple it can be operated by anyone who can operate a phonograph. Records can be kept and filed.
8. THE ANSWERING OR "TALK-OUT" MESSAGE IS MADE BY THE SUBSCRIBER ON THE PEATROPHONE AND AS IT REQUIRES LESS THAN ONE MINUTE TO MAKE, IS CHANGED BY THE SUBSCRIBER TO SUIT THE OCCASION.

FOR FURTHER INFORMATION WRITE

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Courts and Commissions

Ohio Commission Moves Against Wired Gambling Information

The Ohio Public Utilities Commission, prodded by Governor Frank J. Lausche as part of his drive against commercialized gambling, during the week of Apr. 8 issued a four-point order directed at the communications industry which furnishes service to alleged horse bookmakers, etc. It requires the telephone and telegraph companies, unless somebody successfully appeals by Apr. 20, to:

1. Make each applicant for service swear it won't be used in an "illegal enterprise."
2. Investigate any customer suspected of using the service for an illegal enterprise.
3. Furnish the commission with copies of all contracts for private wire service.
4. Stop service immediately upon request of "any government authority."

Company officials were taken by surprise. Western Union Telegraph Co. officials had no comment. Nor did those of the Cincinnati & Suburban Bell Telephone Co.

Randolph Eide, president of Ohio Bell Telephone Co., which serves 80 per cent of the state's telephone users, said his company was "in favor with the purpose of the order."

He complained, however, that making the applicants swear they were honest would ball up company procedures in taking applications.

V V

Illinois Commission OK's Rate Increase for Rantoul

The Illinois Commerce Commission on Apr. 13 approved an application of the Eastern Illinois Telephone Co. to raise rates in its Rantoul exchange.

The one-party business rate will be raised from $3.50 a month to $4.00 and two-party business from $2.75 to $3.50.

The one-party residence rate will be raised from $2.25 to $3.25, and two-party residence from $2.00 to $2.75.

No increase was asked for rural service.

It is estimated that the rate increases will bring in an additional $13,994 revenue yearly for the company, but company officials expect expenses to increase by more than $26,000 a year.

V V

Arkansas Commissioner Urges Telephone Co-ops

John R. Thompson, member of the Arkansas Public Service Commission, was recently reported to have urged farmers in rural areas where no telephone service exists to organize co-operatives immediately.

The commissioner made the statement in a speech to officers and managers of the Arkansas Rural Electric Co-operatives.

Discussing REA financing of extension of telephone service into rural areas, Mr. Thompson was quoted as saying: "Telephone co-operatives should be organized at once and lay claim to whatever territory they want to serve."

V V

Dewey Signs Law Against "Jamming" of Telephone Lines

After July 1, it will be a penal offense in New York State to "jam" telephone lines deliberately—a practice used recently during telephone strikes. (TELEPHONY, Mar. 24, p. 40.)

Gov. Thomas Dewey on Apr. 12 signed a bill providing a maximum penalty of two years in prison on conviction for such a charge.

Jamming is the practice of keeping telephone lines busy by repeated, false calls.

V V

Commission to Investigate Wisconsin Company's Service

The Wisconsin Public Service Commission on Apr. 13 announced it will investigate the Wisconsin Telephone Co. and find out if the company is furnishing adequate service.

The company's announcement that it has canceled future expansion plans prompted the action, Edward T. Kaveny, commission secretary said.

The company was reported to have taken the action when the commission recently ordered it to refund $489,853 to subscribers in 15 communities in connection with a recent rate increase.

The commission will hold a public hearing on May 8.

V V

Elsie, Neb., Celebrates Opening Of First Telephone Company

Everybody in Elsie, Neb., took a day off on Apr. 20 to celebrate and dedicate the opening of service by the first telephone company it has ever known. Gov. Val Peterson was to have been the guest speaker at a program in the city hall, but bad weather prevented him from flying out. L. O. Arstad, general manager of the Nebraska Continental Co., which has exchanges in that area, was a speaker.

Previously the town had been serviced through exchanges at Wallace and Madrid on local business and on long distance through the Ogallala exchange of the Northwestern Bell Telephone Co.

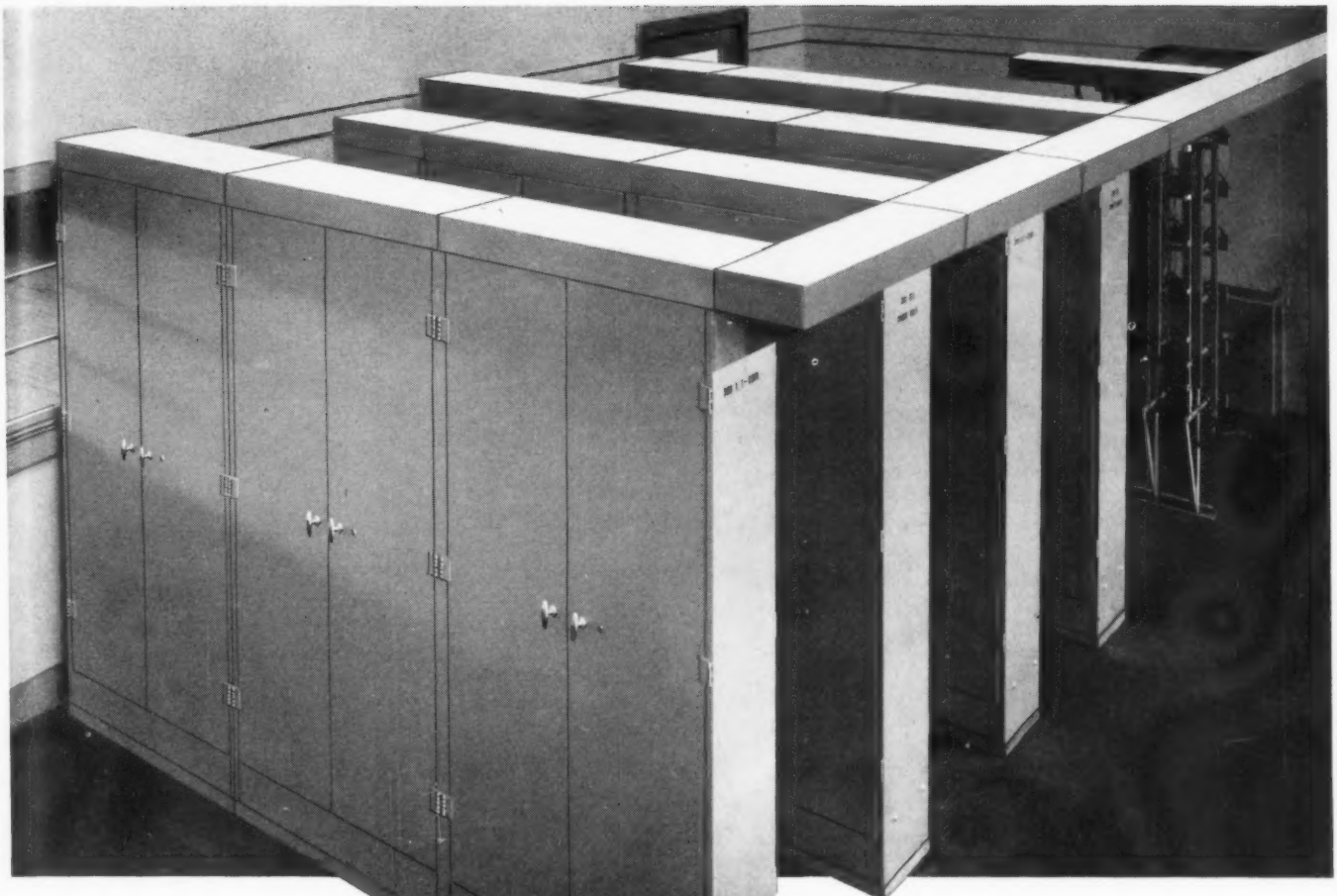
Last year two residents, Art Hanson and Webb Fleming, canvassed the community in the interest of forming a company. With aid from representatives of the Nebraska Central Co. and the Bell and a donation by interested parties who contributed 120,000 hours of labor, a company was organized which built an exchange that will serve 125 business and residence stations. The service area will cover 512 square miles, from a modern building housing a dial switchboard of 100 lines with a total capacity of 400 stations. Elsie has a population of approximately 250.

Officers of the company are: president, Webb Fleming; vice presidents, Ed Pelster and Shelby Soerry; secretary, Art Hanson; treasurer, H. D. Bancroft.

V V

OK's Ohio Purchase

The Ohio Public Utilities Commission has granted the Northern Ohio Telephone Co., Bellevue, authority to purchase the Mifflin & Widowville Telephone Co., Mifflin.



IT'S AUTONOMIC TOO!

PLEASE EXCUSE the three-dollar word, but it happens to just fit a thought we want to impress on you.

Webster's quickest definition of *autonomic* is—". . . Self-governing". Therein is a clue to the difference between North "All Relay" and ordinary automatic equipment. Because North "All Relay" exchanges are truly ALL relay operated, there are no mechanical devices to demand costly servicing. The *only* moving parts are friction-free armatures actuating contacts, with a motion measured in hundredths of an inch.

Because the contacts are wear-resisting gold-alloys, always closing with a self-cleaning wipe action, the only attention "All Relay" Exchanges need is a token preventive maintenance. In other words, a North exchange *is* "self-governing". Before YOU invest in more plant, let a North engineer show you case histories proving these facts.

ALSO: **Now is an ideal time to sell more PABX service *on established lines.***

THE NORTH ELECTRIC MANUFACTURING COMPANY

Originators of **ALL RELAY** *Systems of Automatic Switching*

1430 South Market Street, Galion, Ohio, U.S.A.

Wyoming Cooperative Plans REA Loan Application

A group of Niobrara County (Wyo.) ranchers have organized a new telephone cooperative and plan to apply for a loan from the Rural Electric Administration telephone loan program.

The purpose of forming the cooperative is to improve the present telephone system serving many ranchers living in the Hat Creek, Fairview, Buena Vista and lower Lance Creek communities. At a recent meeting of representatives of the proposed line, C. A. David of Hat Creek was elected chairman, Leslie ZumBrunnen, of Hat Creek, vice chairman; and Henry Wasserburger, of Hat Creek, corresponding secretary-treasurer.

Each member will be requested to contribute a $5.00 membership fee. When the cooperative's application has been approved, members will then be required to pay an equity not to exceed $45.

The cooperative hopes to take on at least 75 members.

V V

Receives Authority to Operate And to Give Switching Service

The Wyoming Public Service Commission recently granted the Chugwater Telephone Co. authority to operate and maintain a telephone system in Chugwater, and to furnish switching service for three farmers' mutual telephone associations.

It also gave the company authority to furnish switching service for the Happy Hollow Telephone Co., The Goshen-Platte Telephone Co., and The Whitcomb Hill Telephone Co., whose lines connect with Chugwater.

V V

Lincoln, Neb., T&T to Offer 10,000 Common Stock Shares

The Nebraska Railway Commission has granted authority to the Lincoln Telephone & Telegraph Co. to issue and sell 10,002 shares of common stock at $24 a share to holders of common stock on Mar. 31, 1951, one new share for every fifteen of record to each. The original application was for 12,500 new shares, but the company amended it before hearing. The proceeds will be used for new construction, additions and betterments.

The commission found that the company's physical plant is of a value of 22 millions; that it is desirable that any new financing should broaden and enlarge the amount or base of its equity or risk capital, and that such expenditures are necessary and proper. The common stock has a par value of $16⅔, and holders have been receiving a quarterly dividend of 37½ cents per share. At the 1949 and 1950 offerings common stockholders paid $20 a share. It has been selling on the market slightly below $30.

The company has outstanding 150,032 shares of common in addition to 45,000 shares of 5 per cent preferred and an open end mortgage of $7,500,000, carrying an interest rate of 2¾ per cent.

V V

Court Injunction, Higher Rates Bring Ninnekah, Okla., Back

B. Richardson, telephone engineer for the Oklahoma Corporation Commission, has received reports that J. B. Carel, owner of Ninnekah (Okla.) Telephone Co., is again back in business. (TELEPHONY, Mar. 17, p. 35.)

This return follows issuance of an order by the commission on Mar. 8, granting him higher rates and requesting that he resume service. Some of his subscribers obtained a court injunction restraining the owner from abandoning service and from the removal of telephone property from Ninnekah.

Despite the fact that the commission granted Mr. Carel rates ranging from $3.75 per month for one-party business down to $2.25 for multi-party (subscriber-owned) service, the company has lost nine telephones since the higher rates were granted. One of the reasons assigned by Mr. Carel for wishing to discontinue his exchange at Ninnekah was the steady loss of subscribers until the number was down to 75.

V V

Authority to Issue Stock and Secure REA Loan Granted in N. C.

Old Town Telephone System, Inc., Winston-Salem, was authorized on Apr. 19 by the North Carolina Utilities Commission to sell 500 shares of $100 par value common stock and borrow up to $300,000 from the Rural Electrification Administration to finance new rural lines.

The company, which operates outside Winston-Salem, told the commission that the money raised will be used for expansion purposes.

V V

$20,000 Nebraska Loan Pending

The Nebraska Railway Commission has taken under advisement an application of the Farmers Telephone Co. of Dodge County, North Bend, for authority to borrow $20,000 at 3.75 per cent for a period of 20 years. No opposition appeared at the hearing on Apr. 20. The money will be used to expand service operations to meet an increasing demand.

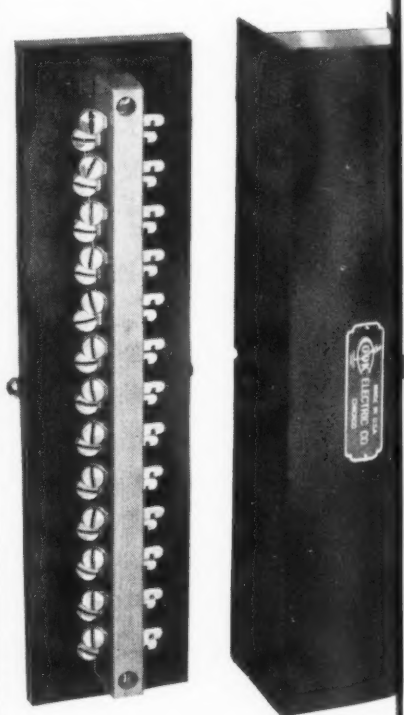
Construction

With the Doubl

and America

cook's type 53

interior junction b



Designed for use in P.B.X. inst
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and for the floor distribution of ca
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screw connections for drop wire
desired—with *economy*. Wo
base; enameled metal cover. S
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and 26 pair capacity.

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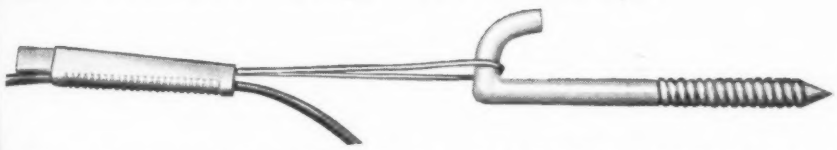
reliable *drop wire clamps*



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Type "P" is designed for twisted pair or parallel drop wire to poles and buildings. Also available in Type "R" for resistance braid (heavy duty drop wire).

Reliable Drop Wire Clamps are unique in that they:

1. Prolong life of drop wires by permitting free swinging at the support, placing all wear on the hardware.
2. Permit stringing and sagging of service drops before cutting wire.
3. Automatically tighten under load, assuring a firm grip without damaging insulation.
4. Eliminate sharp bends in wire.

"Reliable identifies the quality"

for rural lines with fog, rain, humidity — hemingray insulators

(Left): Hemingray "No. 9." Made from only 9 oz. of glass, but with a maximum leakage path approaching standard long-distance design. Inner skirt surface well protected from rain-splash; long skirt protects pin itself.

(Right): Hemingray "No. 14." Its double-petticoat feature is useful wherever fog and humidity prevail. Production economy in design and lightness make its low cost attractive for rural telephone line budgets.

Manufactured by American Structural Products Company

revenue-saving *in long-lasting poles is yours when you use*

DIAMOND C POLES

Now better than ever, as made in Colfax Lumber & Creosoting Co.'s NEW plant

All Diamond C poles are carefully selected from trees growing in the heart of the famous Southern Yellow Pine belt. Each pole is graded according to physical properties desired and pressure-treated with 8 lbs. (more, if you want it!) of grade No. 1 creosote oil, per cubic foot of wood. A new and modern treating plant promises better-than-ever quality and faster deliveries.

Have the lowest possible annual pole cost. Specify . . .

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CHANCE 6" 8-WAY EXPANDING ANCHOR

You can stock this six-inch 8-Way Expanding Anchor for most rural telephone line guying—save on initial costs—on installation time—and save stocking two sizes (it's designed to replace the Chance No. 62 & 64).

The 6870 has a 70 square inch area and a rated soil-anchor holding strength of 14,000 pounds in class 4 soil (crumbly damp).

This anchor has all the fine features of the famous Chance eight-inch 8-Way. It is "streamlined" to expand quickly—no bolts to cut—holding wires shear with a single blow of the expanding bar. There is no wasted area between blades and the weight of the load is carried by eight blades instead of two or four . . . All good reasons why the Chance 8-Way is on the specs of the biggest anchor users in the telephone industry—reasons why you should specify Chance six-inch 8-Way on *your* next order.

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A·B·CHANCE CO·

CENTRALIA, MISSOURI • SAN FRANCISCO, CALIFORNIA

ABC INDUSTRIES

New Telephone System Built In Northwestern Nebraska

A feature story carried in recent Nebraska newspapers covering the construction in the northwestern part of the state of a new telephone system states that some of the ranchmen paid as high as $2,000 to obtain service, because of the long lines that had to be built. Short line subscribers averaged as low as $35. All lines are metallic.

The area had been served by 29 cooperatives or mutuals, and Rural Electrification Administration projects made their lines practically useless. Northwestern Bell furnished much of the necessary engineering, and the ranchers did most of the construction work. Eight thousand poles were set, and modern equipment was installed at a cost of $250,000. The total cost is given at $450,000. Thirty-nine mutuals comprise the system.

V V

Oklahoma Referee Recommends Rate Increase at Duke

The Duke Telephone Co. will secure higher rates if the Oklahoma Corporation Commission follows recommendations, Paul Reed, its referee, announced at the hearing on Apr. 20.

B. Richardson, telephone engineer of the commission, after an inspection of the property, stated at the hearing that he favored granting the rates requested by the company, which are:

Classification of Service	*Proposed Rates*
One-party business	$4.00
One-party residence	3.00
Multi-party rural (wall)	2.00
Switched (partially maintained by the company)	0.83

V V

Summary of Commission Rulings and Hearings

California Public Utilities Commission

Apr. 16: Request of I. B. Toub, Romona, listed seeking restoration of business service pending final determination of complaint vs. Pacific Telephone & Telegraph Co.

Apr. 16: Order listed denying Milo Barry request for restoration of business service at Burbank.

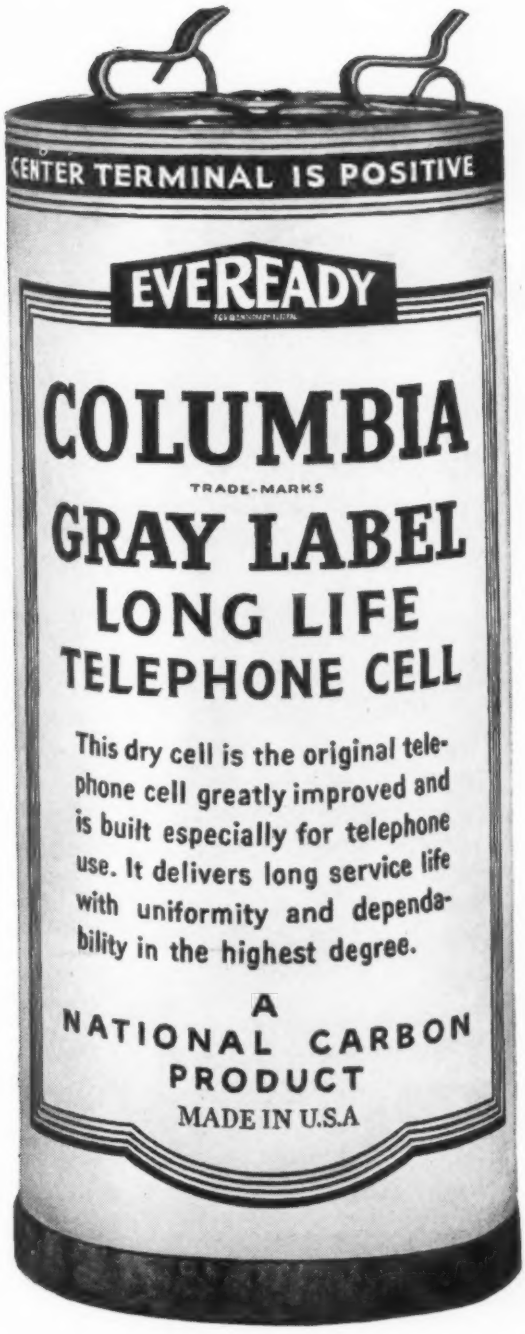
Apr. 16: Listing of application of Colusa County Telephone Co., Colusa, for authority to issue $45,000 promissory note.

Illinois Commerce Commisson

Apr. 23 & 26: Hearing on application of Illinois Commercial Telephone Co., Springfield, for authority to increase rates.

Apr. 26: Hearings on applications of Middle States Telephone Co. of Illinois,

this is it!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This dry cell is the original telephone cell greatly improved and is built especially for telephone use. It delivers long service life with uniformity and dependability in the highest degree.
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Automatic Electric Type 40 Seven-Pair *Protected* CABLE TERMINAL

Here's the handiest, most cost-saving protector you can use to terminate a small number of cable pairs. Can be mounted on pole or directly on building, where it eliminates subscriber drops. Installation is an easy one-man job! Detachable mounting bracket is bolted in position before terminal is placed, and reversible cover permits leading cable in from top or bottom. Each protector pair consists of two Type 17 wood fuses and two positive-grounding discharge blocks with .0055" gaps. Flat shape of terminal (7¼" x 4¾" x 14") enables lineman to climb past easily.

Product of the Specialty Department of:

SA-34: Cable Terminal—less stud
SA-35: Cable Terminal—with stud

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Originators and Developers of the Strowger Step-by-Step "Director" for Register-Sender-Translator Operation . . . Machine Switching Automatic Dial Systems
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1033 West Van Buren Street, Chicago 7, U. S. A.

Park Ridge, and Illinois Bell Telephone Co. for authority to increase rates.

Apr. 26: Hearings on re-statement of expenses incurred by McHenry County Telephone Co., Marengo, in Dec., 1950 and Jan., 1951.

Kansas Corporation Commission

Apr. 23: Hearing on application of Mrs. Verna J. Wise for a certificate of convenience and authority to do business at Webster.

Apr. 30: Hearing on application of Michigan Valley Mutual Telephone Co. and Palmer Rural Telephone Co. for authority to change rates; and for latter to issue $1,200 of common stock.

May 1: Hearing on application of Piedmont Telephone Co. for authority to increase rates.

May 15: Hearings on applications of Peoples Telephone Co., Lebanon, and Denton Telephone Co. for authority to increase rates.

Louisiana Public Service Commission

Apr. 25: Hearing on commission investigation of definition of territories of Delcambre Telephone Exchange and Southern Bell Telephone & Telegraph Co.

Apr. 25: Hearing on application of Breaux Bridge Telephone Co. for authority to increase rates at Breaux Bridge, Parks, Cecelia and Arnaudville.

Minnesota Railroad & Warehouse Commission

May 15: Hearing on application of Warba Telephone Assoc. for authority to increase rates.

May 16: Hearing on application of Backus Telephone Co. for authority to increase rates.

May 17: Hearings on applications of Audubon Telephone Co. and Newfolden Telephone Co. for authority to increase rates.

May 22: Hearing on application of Hanley Falls Telephone Exchange for authority to increase rates.

May 23: Hearing on application of Garvin Community Telephone Co. for authority to increase rates.

Missouri Public Service Commission

Apr. 20: Hearing on request for business service by J. E. Guignon vs. Southwestern Bell Telephone Co.

Nebraska Railway Commission

May 2: Hearing on application of Hamilton County Telephone Co., Aurora, for authority to increase rates.

Oklahoma Corporation Commission

May 24: Hearing on application of 40 petitioners for rural service from Southwestern States Telephone Co., Brownwood, Tex., at Meeker, Okla.

Oregon Public Utilities Commissioner

May 15: Hearing on application of Clear Creek Mutual Telephone Co., Redland, for authority to increase rates.

Wisconsin Public Service Commission

Apr. 24: Hearings on applications of Lund Telephone Co. and Thorp Telephone Co. for authority to increase rates.

Apr. 25: Hearing on application of Coloma Telephone Co. for authority to increase rates.

Panora, Ia., Reviews Telephone History of Past 100 Years

An executive of the Panora (Iowa) Western Mutual Telephone Co., J. T. Kilmer, has been in charge of preparing the telephone history of the town. This is one part of the July centennial celebration for this town of more than 1,100 population. The circulation of the completed history represents intelligent public relations and good advertising.

Throughout the story are studded the names of local people, early subscribers, operators and linemen. Facts are cited calculated to stir sentimental or humorous sensibilities, such as "in the case of one line of some 40 telephones, service was not too satisfactory."

Mr. Kilmer adds that in the early days lines of 30 to 40 telephones or more were common and the problem of limiting the line "to its present membership" was never "fully settled." . . . "when a newcomer applied for admittance to the line, all rules were usually suspended and the applicant 'accepted as one of us'."

The history goes on: "A comparison of early wages and prices with those of today is interesting. In one record we find the entry: 'Two days labor, $2.00.' Another: 'One day, man and team, $1.75.' Wire cost three cents per pound or less. Nails were about $3.20 per hundred pounds. Eighteen-foot native oak poles, peeled and smoothed, sold for 40 cents each, if the tops measured a full four inches. Cedar poles of the same size brought the fancy price of 70 cents each. Telephones cost from $15 to $15.50 each.

"Many of the lines wrote into their by-laws the method of building line: 'Wire shall be carried 12 feet above the ground except at road crossings, where it shall be legal height.' And: 'Poles shall be 32 to the mile and shall be set not less than 3 feet in the ground.' Work in constructing the lines and 'shooting trouble' was necessarily done by the subscribers themselves, since at that time no one was available with any skill or experience along that line. . . . Altogether, though, the job of construction was well done by a forward looking, progressive generation. . . ."

The Panora telephone history shows how intimately bound up in the town's development was that of its telephone system. This centennial celebration also demonstrates that such occasions are good opportunities for furthering the public relations of a telephone company.

"What? Only 16 poles to the mile?"
Crapo HIGH TENSILE TELEPHONE LINE WIRE
COMPARE THE SPAN LENGTHS!
SIZE NO. 12 B.W.G. HEAVY LOADING DISTRICT
Crapo HTL-135
SPANS TO 350 FEET
Crapo HTL-85
SPANS TO 225 FEET
B.B. GRADE
SPANS TO 150 FEET
INDIANA STEEL & WIRE CO. MUNCIE INDIANA

Crapo High-Tensile Line Wire Cuts Cost of Rural Lines

Spans to 350 feet are possible in Heavy Loading Districts where Crapo HTL-135 Telephone Line Wire is used. This means that, in straight runs over flat open terrain, the number of poles per mile can be reduced to 16.

Substantial economies both in construction and maintenance are the result. Initial building costs are lower because of marked savings in material and labor. Upkeep expense is reduced because there are fewer pole structures to maintain. Service interruptions are minimized because Crapo High-Tensile Line Wire offers increased resistance to ice and wind, provides a greater margin of safety.

Crapo High-Tensile Telephone Line Wire is available for prompt shipment from jobbers' warehouse stocks or from our mill.

FURNISHED IN TWO STRENGTHS

Crapo HTL-135 Telephone Line Wire has two-and-one-half times the strength of standard B.B. wire; makes possible spans of 350 feet in Heavy Loading to 500 feet in Light Loading districts. Crapo HTL-85 (No. 12 B.W.G.) has 60% greater strength than B.B. wire, provides for spans of 225 feet in Heavy Loading, 375 feet in Light Loading areas. Both have telephonic transmission qualities superior to B.B. wire.

WRITE FOR VALUABLE ENGINEERING MANUAL!

Be sure to get a copy of this helpful guide to long-span low-cost construction! Ask your distributor of Crapo Galvanized Wire and Strand or write direct for Manual No. 203!

INDIANA STEEL & WIRE COMPANY · MUNCIE, INDIANA

Rural Line Construction

(Concluded from page 19)

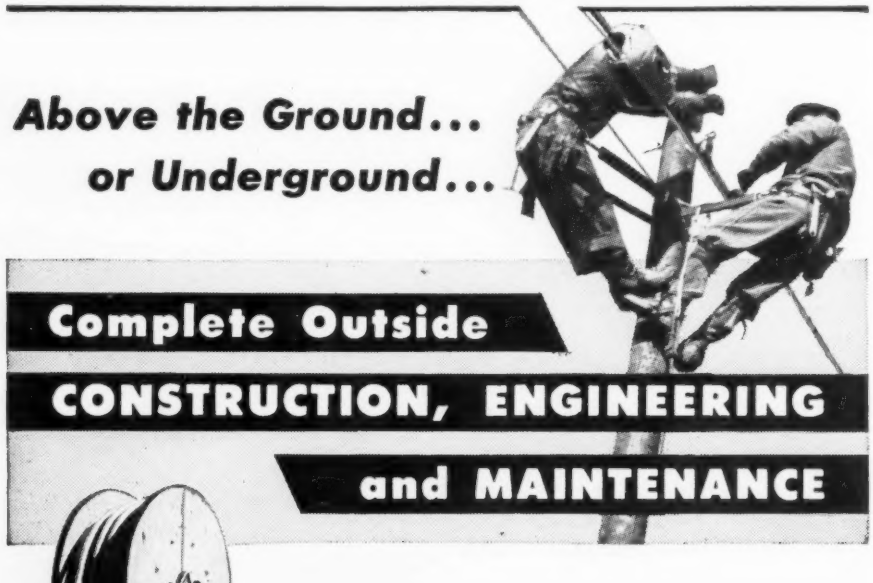
just as efficiently for drop work especially where the wire attaches to the strand between poles. The ladder being attached at two points to the truck makes it safe for the workmen. Undoubtedly, many other uses can be found for this combination outfit in the small plant as well as for some larger jobs.

The first cost of good rural construction may be considerably higher than to produce an inferior job by using a poor grade of poles, setting them too shallow, disregarding the proper support of corner poles, etc., but this is sure to be reflected in subsequent maintenance costs.

Although 20-ft. poles may be used for certain construction, 25-ft. poles will be required in most cases for long-span lines.

Joint construction with power lines is usually more desirable than overbuilding and it is also more economical. However, the inductive effect of the power on the telephone lines should be considered when planning a joint line. The present voltage of the power line as well as any future allowable increase in voltage by the power company should be covered by the original agreement.

The rural line is a vital part of any telephone system and represents a considerable part of the plant investment. Further, clearing trouble and maintenance work is more costly than for the urban plant. For these reasons, every modern approved method of construction and maintenance of the line should be given careful consideration.



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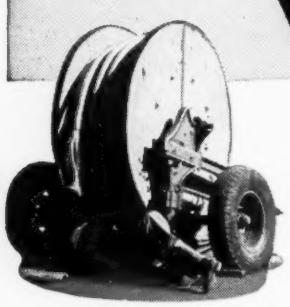


Whatever your problem . . . wherever it may be . . . we can help you plan, erect, repair or maintain your outside telephone plant.

Years of on-the-job experience working with independent telephone companies from coast-to-coast, the finest and most modern equipment, PLUS the know-how of trained and experienced crews assure you efficient, economical, long-lasting service.

Our engineers have the background and practical experience to help you plan and engineer your job and to assist you in obtaining critical materials.

All work is done to A T & T specifications or equivalent unless otherwise requested.

So, why not put this experience and skill to work for you—call us today! Let us give you time and cost estimates on construction, maintenance or repair jobs. No obligation! Do it today!

NEALE CONSTRUCTION CO.
ENGINEERING • CONSTRUCTION • MAINTENANCE
TOPEKA, KANSAS PHONE 4-2621

Japan's Recovery

(Continued from page 26)

toll switchboards. In 1948 the Army felt it necessary to replace the signal corps operators who served military toll switchboards, and PBX's so that these men could learn to be soldiers, and to work with field equipment and participate in tactical maneuvers. A considerable number of American women came over from the United States to take over these jobs. On an experimental basis, Japanese operators were assigned to the military boards to supplement the American girls. The Japanese operators proved so satisfactory that they were assigned to all the operating work still being done by Signal Corps operators, and in addition, as normal force losses reduced the staff of American women, the Japanese took the vacant jobs. The relations between the Japanese operators and the American women with whom they worked were invariably friendly, and in a surprisingly short time, operators of the two races were enjoying social life in the evenings and weekends with one another. The association of the two races benefitted both, for the Americans absorbed the unvarying cheerful, happy attitudes of the Japanese, and the latter the quiet, business-like, courteous manners of the Americans.

By Jan. 1, 1951, nearly all American operators had been replaced, and English-speaking Japanese girls were handling virtually all the military traffic in Japan. This assignment of Japanese to Occupation Force boards not only saved the U. S. Government about $4,000,000 per year in salaries and other expenses for keeping American women on the job in Japan, even more important, it freed the Signal Corps so that its trained men could fight in Korea. When the

hostilities broke out during the summer of 1950 and U. S. divisions moved from Japan to Korea, all Signal Corps personnel could accompany their units knowing, thanks to the Japanese, that there would be no interruption in telephone service in their bases in Japan.

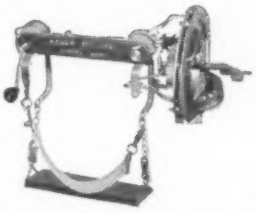
In all, approximately 6,000 Japanese women have been trained to handle English language traffic. Although most of the operators recruited initially had had a little previous experience in English, the size of the program was so great that operators of this background were far too few, and most of the 6,000 were regular, professional Japanese telephone operators who, before entering the English language operator training courses had had no practical experience in using this strange and difficult Occidental tongue. A large percentage of the English learned by these girls was in addition to that given them in Ministry of Telecommunications classrooms. Most of it was learned on their own time, and at their own initiative out of a desire to do a better job.

The availability of large numbers of English speaking operators has enabled the ministry for the first time in its history to meet the needs for English language telephone service of the (non-Occupation Force) foreign community in Japan. In addition to handling calls placed by the Allied Forces, the Japanese operators have, since 1948, been handling the traffic of foreign banks, shipping companies, airlines, and commercial houses in the big cities. The service for non-Japanese speaking foreign subscribers such as these is called "Gai koku go sabisu," or "Foreign Language (FL) service." In each of the big cities, and in the principal tourist resort areas foreigners desiring to place long distance calls may ring a special "FL service" number which is terminated on jacks in the Allied Forces positions of the regular Japanese switchboard. The operators then accept and complete the calls in English.

Besides operators for the types of switchboards mentioned above, English language training has been given to girls who handle overseas telephone calls, and foreign name information service. This latter is especially important in Japan, for the regular Japanese information service carries all listings in Chinese-Japanese characters. Foreign names are extremely difficult to write in characters, for example R. C. Reno, the editor of TELEPHONY, would be written using characters which would be pronounced as follows: A RU SHI RI NO. The author's name, Howard F. Van Zandt, is rendered by characters which read HA WA DO EI FU BA N ZA N TO. At the foreign name information service, all names of FL service subscribers are written in English. Besides Americans and British, there are 48 other nationalities in Japan who make use of the Foreign Language service. English has become the universal telephone language in Japan except for Japanese, Chinese, Koreans, and Formosans.

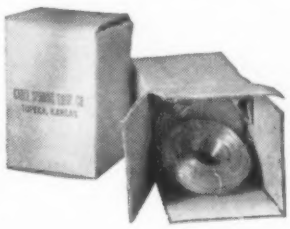
Japan is counting heavily in the future upon foreign tourists to help make up her normally adverse balance of trade. The country is one of the most beautiful in the world, and with its ancient moated castles, its magnificent temples and shrines, its fascinating curio shops, and its superb scenery it has much to charm visitors from abroad. In years past one of the deterrents to travel to Japan was the lack of telecommunications service that could be used by foreigners. Thanks to the new "Foreign Language Telephone Service" and Japan's 6,000 English speaking operators, this problem will no longer discourage visitors from abroad.

On the job records prove that the Neale Model D Pull-type Cable Spinner speeds new work, keeps line charges low.
Cut Maintenance Costs—
Speed New Construction



Neale Model B One Man Cable Spinner operates from ground or strand.

Cable spinning lengthens plant life . . . lowers maintenance costs 2/3 . . . speeds new construction, telephone companies from coast to coast report. You, too, will find cable spinning fast, practical and economical when your crews are equipped with Cable Spinning Equipment Company tools designed specifically for the job. There's a complete line to choose from. Ask your jobber today.



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Use NEALE Wire!

Available in 7 different types and sizes, famous Neale Spinning Wire meets the toughest construction and corrosion conditions.

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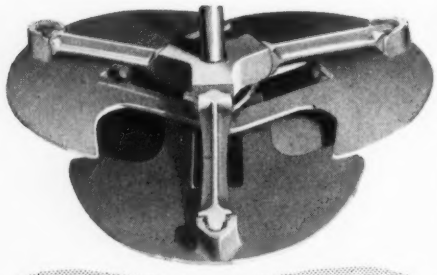
QUICK INSTALLATION
TOUGH FOR LONG LIFE



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The preferred anchor of engineers and crews alike for permanent construction and maintenance work. Complete line of sizes to meet every guying problem. Made of tough, rust resistant malleable iron.

Special nut housing locks anchor firmly on rod and prevents rod from slipping through anchor.

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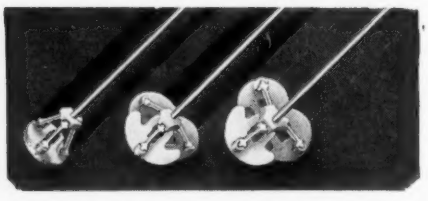

Everstick plates are so designed to expand easily and quickly into undisturbed earth. The wide coverage of expanded anchor assures great holding power in any kind of soil. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

In the Nation's Capital

(Continued from page 23)

come to Penelec will be substantially, if not wholly, offset by the decrease in rates previously referred to; and, as stated by the commission and undenied by Penelec, any increase in revenue would be offset by the necessity of nearly doubling the depreciation charges if they are to be made adequate.

"The record, therefore, supports the conclusion of the commission, that the forseeable rate of return on the purchase price would not justify the price paid: Penelec's own exhibit, a combined income statement of Penelec and the three selling companies for the year ending May 31, 1949, on a pro forma basis, disclosed a net operating revenue of $10,430.82 from the three companies, or a return of slightly over 3 per cent on the $300,000 investment. . . ."

What the court seems to be saying here is that a utility should not pay more for property than prevailing rates will justify in yielding a return. But since the purpose of establishing such an original cost purchase would be to justify a higher rate, it looks like a vicious circle. The purchaser of a utility property is first condemned to low rates because the property has an inherited low cost, and is then forced to go on carrying the low cost base of his predecessor because the low rates won't justify any higher base! Not much future in buying utility properties under that setup.

It is understandable why there would be objection to the recognition of any excess over original cost in the sale of a utility property by one company to another company with which it is affiliated or under a common holding company control. One of the complaints made about the old utility holding companies of the '20s and early '30s was this very practice of having subsidiary companies sell utility properties back and forth to each other at increasing purchase prices which were not the result of free bargaining. Under such circumstances, "original cost" to the ultimate company might be run up to an artificially excessive figure. But to apply the "excess cost" doctrine to a property which was purchased in the open market, so to speak, puts a pretty severe handicap on the purchaser.

No sane owner of property (utility or otherwise) would sell his holdings in today's inflationary markets for the same price he paid 20 years ago. One has only to price real estate in the open market today to see how much of a markup home owners are demanding over their original purchase prices. But the FPC says—and the third U. S.

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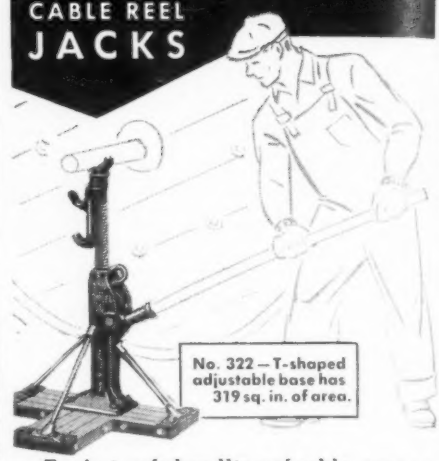
Simplex
CABLE REEL
JACKS



For fast, safe handling of cable, rope or wire. Ten models; capacities from 1 to 15 tons. Single or double acting ratchet lowering types. Powered by famous Simplex Gold Medal Safety Award mechanisms, unexcelled for dependability and ease of operation. Also 3 screw-type models for economy. All with laminated, oil treated, oak bases for all-weather protection.
SEND FOR BULLETIN: UTILITIES 49

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PROMPT DELIVERY
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Write for samples and quotations

Circuit Court of Appeals confirms the rule—that the original cost of a utility can never exceed the dollar investment as of the date the property was launched into utility operation (aside from the added cost of subsequent additions and betterments, minus depreciation).

V V

Bravery and Dispatch Mark Honaker, Virginia, Fire

While flames were consuming the Honaker, Va., exchange of the Chesapeake & Potomac Telephone Co. recently, Mrs. S. B. Wilson, chief operator, displayed unusual courage by sticking to her post until the last minute.

By the time she had notified fire department, telephone and business offices in the area, the stairway leading to the office was impassable, and she was forced to escape through a window and down a ladder, although she was almost suffocated by smoke.

An hour later two emergency telephones were in service. Meantime a small switchboard was dispatched by truck from Roanoke, Va. By the time the first switchboard arrived, a permanent one and related equipment were being flown to within 100 miles, then trucked the rest of the way to Honaker.

Throughout the period that the exchange was out of service, motorized messengers stood by in readiness to deliver emergency messages to subscribers, or to carry them to emergency telephones.

Thanks to assistance from telephone people from surrounding towns, and the on-the-spot bravery of Mrs. Wilson, service was restored to all of Honaker's approximately 375 subscribers within 36 hours.

V V

Telephone, Telegraph, Radio In White House Bomb Shelter

An elaborate radio, telephone and telegraph system has been installed in the White House air raid shelter to keep President Truman in contact with the government in event of enemy air attack, it was learned recently.

The shelter's special ventilating system, originally designed as a protection against poison gas, reportedly has been modernized to guard the President against radioactive dust particles from an atomic bomb blast.

Details of the new devices are closely guarded secrets. But it is known that in connection with repair and renovation of the White House itself, the thick concrete shelter has been refurbished and a number of improvements added.

The shelter, built in 1942, was designed only for brief occupancy. The remodeled shelter, however, will permit much longer tenancy.

"The President can stay down there now for a hundred years if he wants to," one White House staff member said.

One of the recent installations is a new communications set-up, including a telephone switchboard to handle presidential calls if the regular White House board has to be abandoned. There also are radio and telegraph connections in the subterranean bunker.

Presumably, the switchboard would be connected with top government departments, particularly defense, and nearby military installations.

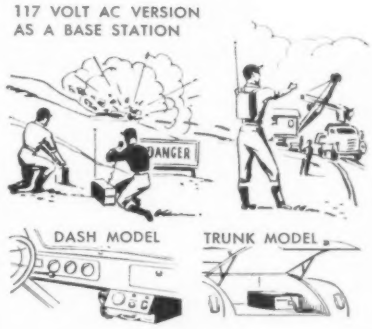
V V

"If history is any criterion, reform will not come from within big government. It will come from the American people. Higher standards of morality will be imposed from outside Washington.—Brownsville (Pa.) Telegraph.

New Maintenance Tool

6 OR 12 VOLT DC VERSION AS EMERGENCY BASE STATION

117 VOLT AC VERSION AS A BASE STATION



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the *best* in low-cost
2-WAY RADIO

Take it along—Anywhere, it's built to take it. Eliminates outage, mileage, maintenance costs.

Long, trouble-free operation and protection against obsolescence.

No less than EIGHT exclusive MOTOROLA developments make it your first choice in low-cost 2-way mobile radio!

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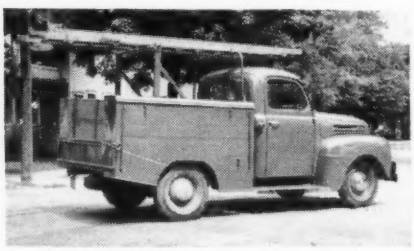
SPECIALISTS IN MOBILE RADIO FOR 20 YEARS

4545 AUGUSTA BLVD., CHICAGO • ROGERS MAJESTIC ELECTRONICS, LTD., TORONTO, CANADA

Simple, Trouble-Free Aerial Service Unit—by EAGLE

THIS combination ladder and all-purpose service body unit can be mounted on 1/2 and 3/4 and 1 ton trucks — a mobile, aerial service unit with a wide range of usefulness.

Extension ladder available in 24 ft., 28 ft., 32 ft. and 36 ft. lengths. Provides aerial equipment with no mechanical devices subject to breakdown or requiring maintenance attention. One-man operated — ladder easily extended or lowered and closed. Ladder is mounted clear of body floor. Service body offers safe, weatherproof storage compartments for tools and materials — available in 74 inch, 84 inch, and 94 inch lengths. Send for complete information on the Eagle Aerial Service Unit.



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Utility Bodies • Trailers • Pole Derricks
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Eagle equipment is engineered by and for utility men expressly for their needs

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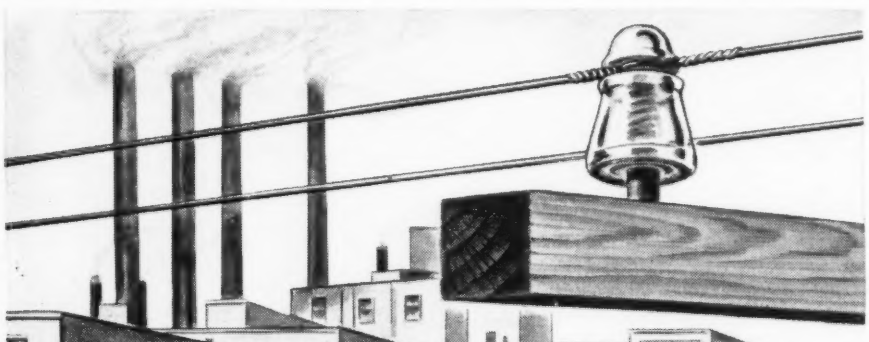
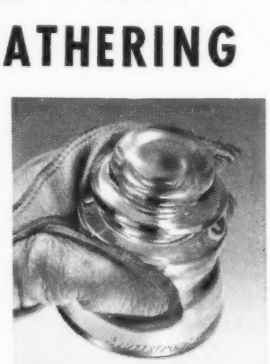


Never a worry about WEATHERING

Armstrong's Glass Insulators are made of highly inert glass that's unaffected by airborne chemicals. There are no dirt-collecting pit holes formed in the insulator surface that might cause premature failure in service.

These practical insulators are hand-tested for accuracy of thread contours. They're tested for resistance to thermal shock, too. Mechanical tests and field service have proved that these insulators support loads that bend standard mounting pins.

See your distributor for samples or write to Armstrong Cork Company, Glass and Closure Division, 295 Fifth Ave., New York 16, N. Y.



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ARMSTRONG'S GLASS INSULATORS
for communications . . . for power

Six Promotions Announced by Lincoln, Neb., T&T

Several important changes in executive and managerial positions of The Lincoln Telephone & Telegraph Co. were announced recently by H. H. Wheeler, vice president. They were effective Apr. 1.

F. E. Behm, general plant superintendent, will retire after more than 50 years in the telephone business and will be succeeded by John A. McKinzie, formerly eastern district manager. T. C. Cone, area manager at Nebraska City, will succeed McKinzie. A. M. Newens, area manager at Plattsmouth,

J. A. McKINZIE

will become area manager at Nebraska City and E. A. Ernst, wire chief at Nebraska City, will move to Plattsmouth as area manager. Ralph E. Wait of Hastings has been appointed area manager at Osceola, thus establishing a new office there.

Mr. Behm began his career in the telephone business in October, 1900, with the Nebraska Telephone Co. at Omaha. After working there seven years as an installer repairman and switchboardman, he was employed in 1907 by the Automatic Telephone Co. of Omaha, where he was chief installer for five years. In 1912 he moved to Lincoln and joined the Lincoln Telephone & Telegraph Co. as special inspector in the district plant chief's office. He has been with the company at Lincoln since, with positions of advancing responsibility. In 1913 he became special installer and later that year was named chief of service. The following year he became district plant chief and served in that capacity until his appointment as district manager in 1922. He was advanced to assistant plant superintendent in 1930 and in 1939 became the company's general plant superintendent.

Mr. McKinzie has been district manager of the company's eastern district since 1929. Before joining the Lincoln company he was employed for eight years in the office of the telegraph construction department of the Burlington Railroad. He was first employed by The Lincoln Telephone & Telegraph Co. as a clerk at Lincoln

T. C. CONE

in December, 1915, and has been located there since that time. In 1918 he became a plant statistician and in 1921 was appointed chief clerk of the construction department. Two years later he was advanced to superintendent of supplies where he had charge of the purchase of all materials and equipment used by the company. He held that position until he was named district manager in 1929.

T. C. Cone joined the company in 1924 as a groundman in the construction department at Lincoln. Before that he worked for the Arkansas Valley Telephone Co. at Great Bend, Kan., and the Nebraska Telephone Co. (now Northwestern Bell) in Nebraska, South Dakota and Iowa. He became a clerk at Lincoln in 1925 and was appointed chief clerk in the Lincoln construction department in 1927. In 1942 he joined the U. S. Army Signal Corps and served as communications officer for the Second Air Force and Fifteenth Air Force at Colorado Springs, where he held the rank of lieutenant colonel. He returned to the company from military service as a construction foreman in 1946 and was promoted to area manager at Seward the next year and in 1950 was named area manager at Nebraska City.

After graduating from Drake university, A. M. Newens joined the company at Lincoln in 1931 as a solicitor. He later became a commercial representative and in 1936 was named assistant telegraph manager. He was appointed area manager at Plattsmouth in 1946. During World War II he held the commission of captain in the U. S. Army Signal Corps and served with the occupational forces in Korea.

E. A. Ernst has been with the company since November, 1928. He was a lineman in the construction department at Hastings, Hebron, Lincoln and Auburn before appointment as manager at Syracuse in 1944. He served there until moving to Nebraska City as wire chief in 1949.

R. E. Wait joined the company as an installer and repairman in 1925 at Lincoln, and in 1927 became a combinationman in the toll wire chief's office. In 1929 he was made a first class testboardman and in 1934 was named district clerk at Lincoln. He moved to Hastings in 1942 as district clerk in the office of the western district manager.

V V

>> As two telephone linemen were scurrying up adjacent poles to repair a cable, a woman drove by in her shiny new automobile. Turning to her companion, she remarked, "Look at those nitwits. From the way they're acting you'd think I'd never driven a car before."

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Bell Adds 600,000 Telephones Despite Defense Curtailments

The defense program is curtailing new telephones for civilian use, Leroy A. Wilson, president of American Telephone & Telegraph Co., said on Apr. 5. Nearly 600,000 telephones were added in the first quarter, but unfilled orders inched above a year ago, he said.

Mr. Wilson reported AT&T earned a net income of $79,370,000, or $2.73 a share on 29,088,282 shares outstanding, in the quarter. March figures were partly estimated. In the first quarter last year net income was $64,388,689, or $2.42 a share on 26,582,912 shares.

The addition of 600,000 telephones in the quarter brought the total in use to nearly 36 million, Mr. Wilson said. A year ago there were 33,900,000. The increase has been accompanied by a growing volume of toll and long distance messages, stockholders were told.

"The Bell System companies are continuing to meet large civilian telephone needs in addition to taking care of increasing defense communication requirements," he continued. "However, demand is so great that despite the heavy construction program it is still not possible to meet all civilian requests as promptly as we should like."

The report showed total operating revenues of $66,430,000 for the first quarter against $56,811,398 a year earlier. Operating expenses and taxes increased to $57,270,000 from $48,237,690.

Mr. Wilson said the recent offer of 12 year 3⅜ per cent convertible debentures to stockholders was successfully concluded last month with about 408 million dollars of debentures subscribed.

"Current Bell System earnings are 6.3 per cent on capital, half of which is debt," Mr. Wilson said. "Earnings must be adequate to bring about conversion of debentures into stock and thereby reduce debt. The system has been able to obtain the capital needed to meet postwar service demands because it had less than one-third debt five years ago. We should be equally well prepared for the future."

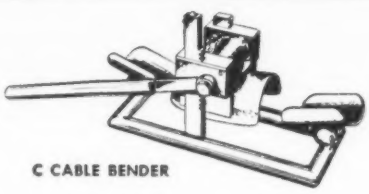
"As long as telephone wage, tax and material costs continue to go up, earnings can be made and kept adequate only by further increases in telephone rates.

"Rate increases so far total only a little more than half the amount of telephone wage increases of the last ten years—to say nothing of other higher costs. Most Bell System companies have therefore had to request

Federal PTM MICROWAVE . . . for toll circuits without line construction

FEDERAL TELEPHONE AND RADIO CORPORATION

An IT&T Associate — *Clifton, N. J.*



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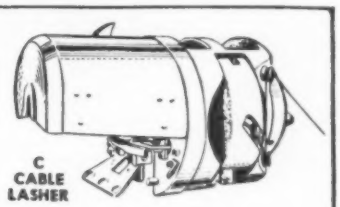

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additional increases in rates, and other applications will be necessary.

"Rate increases authorized and pending average less than 25 per cent of revenues. This is far less than the rise in prices of food, clothing and most other things people buy."

The first quarter figures reported are those of AT&T, parent corporation of the Bell System, and include earnings of subsidiaries only to the extent received by the company as dividends.

The Operator's Corner

(Concluded from page 42)

before she has released the called station, what procedure should be followed?

(3) When an operator receives a request to make a report charge collect after she has released the called station, after reaching the called station again, what phrase should be used in obtaining an acceptance of the charge?

(4) If a report charge is not accepted by the called station when the calling person requests the operator to make this charge collect, what entry is made on the toll ticket and what phrase is used in giving this information to the calling station?

(5) Should an operator ever voluntarily try to make a report charge collect in a case in which the calling station has not specifically requested her to do so?

Answers are presented on page 73.

WU Marks Centennial; Starts Second Century of Service

Western Union began its second century of service to the nation as a new company, with its operations highly mechanized and ultra modern, on Apr. 1.

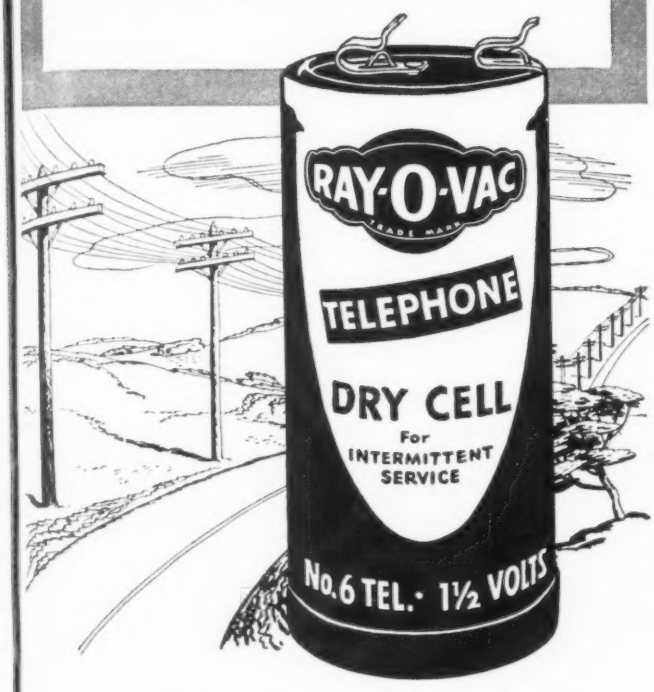
Organized Apr. 1, 1851, as the New York and Mississippi Valley Printing Telegraph Co. in Rochester, N. Y., and changing its name to Western Union five years later, the nation's telegraph company is observing its 100th anniversary throughout this month.

Because of the Korean conflict and the necessity for concentrating attention on the special defense communications requirements of the armed services, the government and industry, the company is not holding an elaborate observance of its centennial.

Western Union's first executive office in Rochester, N. Y., in 1851 was equipped with a single roll-top desk, a few chairs and a cast-iron cuspidor shaped like a plug hat. It was a modest

Cut replacements

... reduce operating costs



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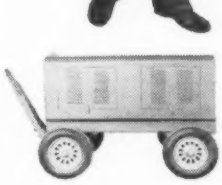

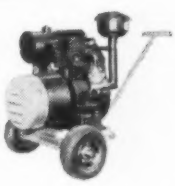

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beginning. But the men who founded the company had great plans.

Despite competition from fifty small, local telegraph companies, widely varying rates, and a skeptical public that viewed the telegraph as little more than an interesting toy, Western Union's first leaders were inspired with one dominating idea—to provide their young, growing nation with the world's finest communications system.

The goal that was but a dream 100 years ago was reached long since, and new goals of technical progress, speed and efficiency are constantly being attained.

Western Union is now prepared to meet both peacetime and emergency demands. It has doubled its World War II capacity and increased its efficiency by means of a new, highly-mechanized system of automatic telegraph transmission including facsimile. The cost of these and other improvements was $100,000,000; the result is the best and fastest telegraph service in the world.

A newly-completed network of fifteen high-speed switching centers is now in operation. Each center serves an area of one or more states. The operator transmitting a message from a Western Union office simply types a routing symbol at the beginning of each telegram. That symbol causes an "electrical brain" at the message center to route and flash the message to its destination. Under this system, a telegram is typed only once, at the point of origin.

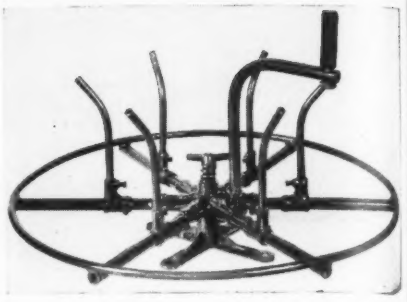
Because of this modern, high-speed switching of telegrams, the substitution of microwave and carrier circuits for pole lines and wires, and improved methods of picking up and delivering telegrams by Desk-Fax machines, telegrams and cablegrams now move faster and more efficiently than ever before.

Over 43,000 Western Union employes, here and abroad, now are busy moving annually over the extensive telegraph network some 200,000,000 telegrams, 8,000,000 foreign and domestic telegraph money orders, and 5,000,000 cablegrams, many of a military and diplomatic nature. Additional billions of words are handled for the nation's press and over private wire systems leased to many leading industries.

V V

Buys Kentucky Company

Purchase of the Poplar Plains (Ky.) Telephone Co. by the Ashland Home Telephone Co. was completed on Apr. 3. The company was purchased from its owner, Riley Caudill, and the present magneto system will be continued in operation pending eventual conversion to dial.



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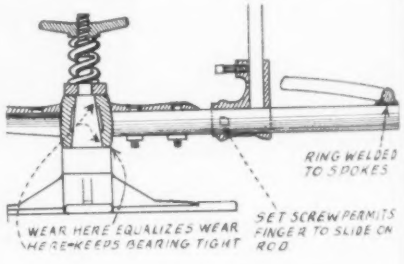
The Suttle reel with the take-up handle provides six adjustable forks to make a round coil when taking down used wire. Ideal for salvaging that used wire you may need next winter.

For Stringing or Taking Up All Telephone Wires

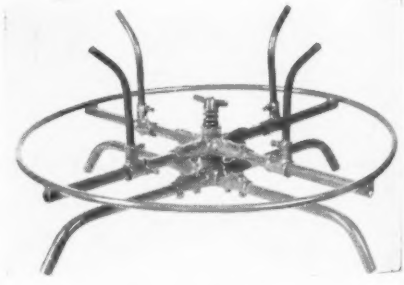
SuttleWire Reels

7 — Styles or Models — 7



It Never Wobbles

The cone-bearing feature on Suttle reels prevents spindle wobble even after years of wear because the socket slides up on the cone as it wears.



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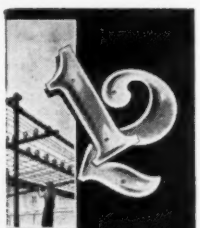

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Shown above is a group of those present at the pre-cut-over dinner at Norwich, N. Y. Left to right: H. A. CUNNINGHAM, executive secretary, New York State Telephone Association; T. H. FERRIS, director of Chenango & Unadilla Telephone Corp.; Mayor J. F. BENEDICT; W. A. SEELY, president and general manager; O. A. THOMPSON, chairman of the Chenango & Unadilla company; L. L. RUGGLES, chief sales engineer, Automatic Electric Sales Corp., Chicago, and ARTHUR GRIMM, Syracuse, division manager of the New York Telephone Co.

Norwich, N. Y., Converts to Automatic Dial Operation

Telephone users at Norwich, N. Y., headquarters exchange of the Chenango & Unadilla Telephone Corp., began dialing their calls recently, when a new 2,100-line Strowger automatic switchboard and a new eight-position toll board were cut into operation, to provide modern service to some 5,000 stations in Norwich, Preston, Plymouth, Lyon Brook, White Store, King Settlement and Whaupaunauncau. Use of the automatic equipment was inaugurated by a call to W. A. Seely, president and general manager of the company, from the city's mayor, J. Fred Benedict.

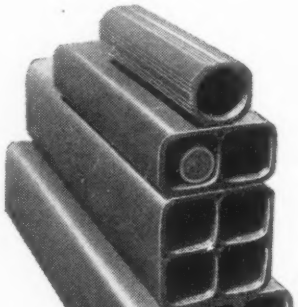
The cut-over ceremony was preceded by a meeting of the board of directors and a celebration dinner at the Chenango Hotel. Mr. Seely, who presided, paid tribute to the members of his organization for their tireless efforts in bringing the company's modernization program, which was begun in 1945, to successful completion.

T. Harvey Ferris of Utica, veteran member of the Chenango & Unadilla board of directors, received warm commendation from president Seely for his unstinted interest and devotion to the Norwich company.

President Seely also paid a glowing tribute to Otis A. Thompson, board chairman of the Chenango company. He introduced him as "the oldest telephone employe in this part of the country." Mr. Thompson in addressing the dinner guests, voiced his appreciation for their interest and presence. "This is the fruition of a major step in our long term plans," he said.

The transfer of service from the old manual exchange to the new office was handled under the direction of Clarence Ingraham, plant superintendent, and Frank Rooney, wire chief, assisted by Robert Quackenbush, plant cable superintendent; Carlton McLean, test board man; Charles Pitfido, chief switchman; and Donald Redmond, switchman.

Telephone company representatives at the cut-over, besides those already mentioned, included: George F. Shoemaker, assistant general manager; Barton Gifford, equipment engineer; W. S. Kingman, treasurer; Carl Purple, methods supervisor; Leon L. Carter, auditor and secretary; Edward O'Hara, director; David F. Lee, director; E. B.



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The proved and standard Protection for Underground Telephone Cables.

Cheapest in the long run. Highest quality and a full line of shapes.

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Guild, director; Arthur Morse, director.

Representing Automatic Electric Co. were: L. L. Ruggles, chief staff sales engineer; L. F. Shea, New York sales office; John Gunther, sales representative from Delmar, N. Y.; Gilbert Magruder, installer; and E. R. Girard, representing Automatic's operating department.

V V

Col. William Talbot Takes Defense Post in Communications

Col. William M. Talbot, United States Air Force (retired), has been named director of the newly-created warning and communications division of the Federal Civil Defense Administration, it was announced on Mar. 26.

The warning and communications division of the FCDA is responsible for the design, installation and operation of the nation-wide warning system that will warn local civil defense agencies and the public of imminent or actual enemy attack. This division further is charged with the design of control centers and associated communications that may be required to control civil defense.

Col. Talbot attended McKinley Technical high school and George Washington University in Washington, D. C., before his graduation from the U. S. Military Academy at West Point in 1929. His subsequent military service included tours of duty with both the Coast Artillery and the Signal Corps. He also is a graduate of the Command and General staff school, Leavenworth, Kansas, and the Signal Corps school, both of the U. S. Army.

Prior to World War II Col. Talbot developed mobile radio communications for the U. S. Army, was assistant signal officer in charge of wire communications for the Eighth Corps Area, San Antonio, Tex., and developed modern communications for cavalry divisions while he was Signal Officer, First Cavalry Division, at Ft. Bliss, Tex. Subsequently he worked in the development and installation of radar and communications for air defense and air raid warning systems for the United States and its possessions. He also helped develop air support of ground troops in field operations and conducted communications necessary to effect radar bombing, and he received many medals for his war services.

In 1946 Col. Talbot retired from the army and, except for a period in 1949 when he was recalled to active duty to develop a ground observer corps and an air raid warning system for the Air Force, has been employed by the Chesapeake & Potomac Telephone Co. in Washington, D. C.

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OAK BRACKETS

1½"x2"x10" Oak Brackets, per 100 ..... $5.35
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¼ in., per 1000 ft. $26.93
5/16 in., per 1000 ft. 36.81
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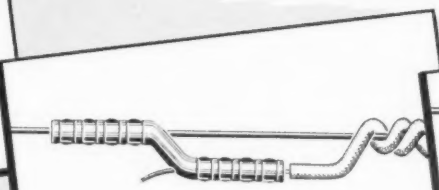

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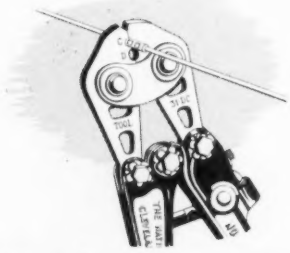

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Mr. Goewey is survived by two sons, George E., manager of Diamond's Chicago office, and J. Edward, Jr., of Asbury Park, N. J.; also two brothers of Newark, N. J.

Answers to Questions on Page 42

(1) Enter "R Col" in the "Collect" space.

(2) The operator should try to obtain the acceptance of the report charge before releasing the station, saying, "Mr. (calling party) wishes you to pay the report charge. Will you accept it?"

(3) Say, "This is the (OTC) operator. Mr. (calling party) at (calling place) wishes you to pay the report charge. Will you accept it?"

(4) Enter "No" in the "Accepted" space on the toll ticket, draw a line through the entry "R Col" and give the report to the calling station, saying, "Mr. (called party) will not accept the report charge," and release the line.

(5) No.

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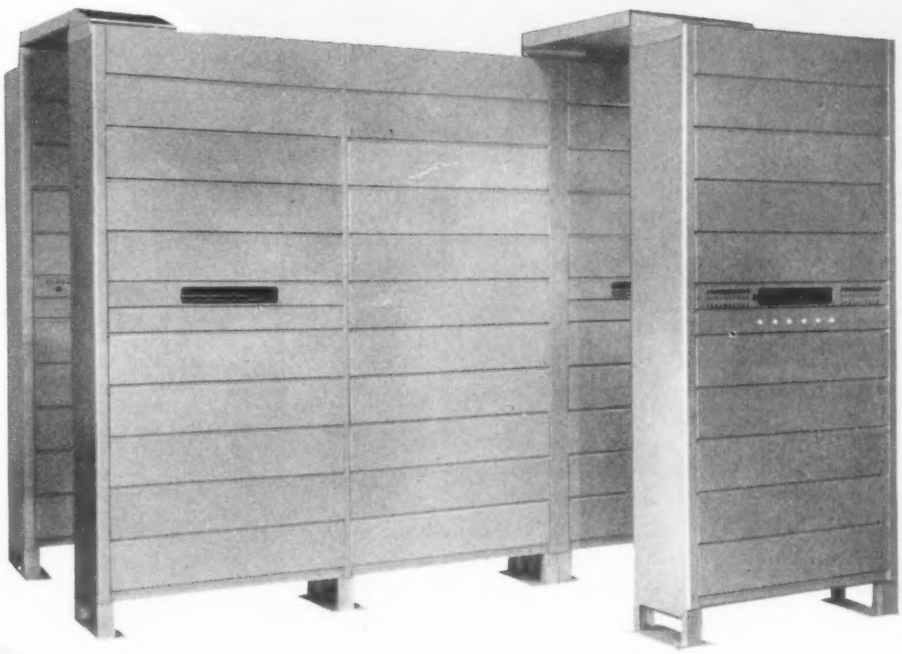
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